

Fuel Modification Plan Guidelines



A Firewise Landscape Guide for Creating and Maintaining Defensible Space



County of Los Angeles Fire Department
Prevention Services Bureau
Forestry Division
Brush Clearance Section
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FREQUENTLY ASKED QUESTIONS

A series of Frequently Asked Questions follow to help you navigate the Fuel Modification Plan Guidelines.

1. "What is a Fuel Modification Plan and why do I need to have one approved?"

A: A Fuel Modification Plan identifies areas on a property where vegetation will need to be thinned or removed to create defensible space. It will also incorporate a landscape plan for any planting proposed for the site. For additional information on what a Fuel Modification Plan consists of and why it is required prior to the issuance of some permits, see page 4.

2. "How can I find out if I am in a Fire Hazard Severity Zone and am required to do a Fuel Modification Plan before I can obtain a Building Permit?"

A: When referred to the Fire Department, you should be given a checklist based on where you are building, outlining all the requirements you need to complete. Other agencies or cities may also require a Fuel Modification Plan be approved prior to approval of the plan "In Concept" or for a Conditional Use Permit.

3. "I already understand the design principles of Fuel Modification Zones, and just need to go directly to the submittal procedures for Preliminary or Final Fuel Modification Plans. Where do I look and what do I need to submit?"

A: You can review the section on the plan review process beginning with page 20 of this document. For a list of what needs to be submitted, see the "Fuel Modification Plan Submittal Checklist" in the appendix at the end of the guidelines.

4. "Where can I find more information on how fuel modification zones are established before I begin my plan submittal?"

A: You can review the section "FACTORS DETERMINING THE WIDTH OF FUEL MODIFICATION ZONES" beginning on page 9.

5. "I am not legally required to submit a Fuel Modification Plan, but can this document still give me useful guidelines for making my family, property, and community safer and more accessible in a wildland fire?"

A: Yes. By following the concepts within this document to create defensible space, you can significantly increase the chances of your home surviving a wildfire.

6. "I am required to create defensible space, by the Fire Department, around an existing home within a Fire Hazard area and would like some ideas for replacing existing vegetation. I also have concerns regarding erosion. Will this document be useful?"

A: This document can assist you in finding plants suitable for your property that will help with both situations. For additional information on erosion, you should contact your local Public Works office or jurisdictional Fire Department Forestry Unit for advice. Both of these agencies have handouts available specifically on erosion control. There is a list of phone numbers of the jurisdictional Forestry Units in the Appendix and on-line at <http://www.fire.lacounty.gov/forestry/ForestryOps.asp>.

7. "How long will the review take?"

A: The actual time of review for every Fuel Modification Plan is different because of the differences in the existing site conditions, proposed landscaping, and the number of structures or lots on the plan. The most important factors in determining the length of time the Fuel Modification Plan will be in the review process are the number of plans submitted prior to yours that are also waiting for review, the status of the plan check fee payment, and the completeness of the initial submittal. Well developed and professionally done plans are typically easier to review and often require fewer corrections. Hiring a professional that has submitted plans is not a requirement, but it may prevent the need for a second review of the plan. A list of such professionals is available at <http://www.fire.lacounty.gov/forestry/FuelModificationConsultants.asp>.

7. "Is there a plan review fee?"

A: Yes. The actual amount will be determined after submittal and is based on the number, type, and size of structures under review and/or the number of lots being developed.



Installed Fuel Modification Plan

PURPOSE AND HISTORY OF THE GUIDELINES

These guidelines are designed to aid people developing land or building structures within the jurisdiction of the County of Los Angeles Fire Department and within a **Fire Hazard Severity Zone**, understand the process of plan review and approval. This document also provides a basis for those that wish to re-landscape their properties, in order to better protect their existing homes from wildfires, using the principles of Firewise Landscaping. Unlike the construction of a building, the nature of fuel modification and variables of each site make specific, blanket requirements impractical.

The dry, sunny climate and variable terrain of Southern California combine to create an environment where wildfires are a part of the natural ecosystem and an almost year-round occurrence. This ecosystem fosters a diverse fire-adapted community of plants and animals. Although human caused wildfires far outnumber naturally occurring wildfires within Los Angeles County, both have the potential to create situations where structures in the Wildland Urban Interface can be at risk. All vegetation will burn, even though irrigation has created a deceptively lush landscape of ornamental plants.

Following the loss of lives and structures during the 1993 wildfire season, the Los Angeles County Board of Supervisors created the Wildfire Safety Panel to offer recommendations that would help reduce the threat to life and property in areas prone to wildfires. One of the recommendations was to follow the findings of the Wildland Urban Interface Task Force and another was to enforce the provisions of the Bates Bill. Jurisdictional Fire Departments were required to establish a set of guidelines and landscape criteria for all new construction in Fire Hazard Severity Zones. As a result, Fuel Modification Plans became a requirement within Los Angeles County beginning in 1996.

In the areas served by the County of Los Angeles Fire Department, all new construction, remodeling as defined by the fire code, construction of certain outbuildings and accessory structures over 120 square feet, parcel splits and subdivision/developments within areas designated as Fire Hazard Severity Zones will require a Fuel Modification Plan approval before the applicable land division, Conditional Use Permit, or Building Permit will be approved. The County of Los Angeles Fire Department Forestry Division's Fuel Modification Unit is responsible for processing, reviewing, and approving these plans.

The California Department of Forestry and Fire Protection (CAL FIRE) and the Office of the State Fire Marshal (OSFM) revise and map all Fire Hazard Severity Zones, with moderate, high, and very high designations every 5 years. These zone designations establish minimum standards for building construction and exterior landscape features in an effort to mitigate the increasing losses from our cycle of wildfire events. CAL FIRE designates the Severity Zones for all State Responsibility Areas (SRAs). In Local Responsibility Areas (LRAs), the jurisdictional County or city determines the Severity Zones with approval from the state that are then adopted by local ordinance or city councils.

You do not have to be building a new structure in a Fire Hazard Severity Zone to benefit from information contained in this document. You may be required to maintain a 100' or wider area for hazard reduction where you live and you are looking for advice on what to plant in the area you maintain. Or, you may be in a neighborhood, not directly adjacent to open areas of native vegetation, but water restrictions and/or drought has affected the ornamental vegetation around your house or business and created a significant hazard from flying embers. Either way, the concepts provided should help you create an area of increased defensible space.

The three major sections that comprise these Guidelines are: 1.) definitions and concepts related to fuel modification and firewise landscaping, 2.) factors used by the Forestry Division in determining a minimum width for fuel modification and an explanation of the requirements within zones that make up the Fuel Modification Plan, and 3.) submittal requirements for obtaining approval prior to issuance of a Permit and Certificate of Occupancy. The Guidelines can be used as a design reference, but should not be used for understanding fire behavior or meeting requirements within other jurisdictions, nor

should they take the place of hiring a knowledgeable professional. Many excellent web and print resources are available. If you are seeking further information, some have been included in the "Help" section of the Appendix. There is also a Glossary, for the technical terms used out of necessity as part of the Guidelines. These technical terms should be used with caution, as they can have different meanings in other jurisdictions.

WHAT IS FUEL MODIFICATION?

Fuel Modification, within the County of Los Angeles, can be defined as the creation of Defensible Space around a structure through the removal and thinning of vegetation on a site and or development and installation of new planting using the concepts of Firewise Landscaping. This is accomplished through the removal of highly flammable and dead vegetation around a structure, thinning of additional vegetation, and planting of the site using Fuel Modification Zones. At the minimum, each site requiring a plan review will have to meet the County hazardous vegetation removal requirements dictated by the site conditions and Fire Code. Any proposed landscaping will be reviewed during the plan check process for its appropriateness.

What is a Fuel Modification Zone?

A **Fuel Modification Zone** is a specific area where vegetation has been removed, planted, or modified in ways that increase the likelihood a structure will survive a wildfire, improve the defensible space around that structure needed for firefighting activities, and prevents direct flame contact with structures. Vegetation includes native and ornamentals plants, non-native naturalized annual grasses, and other invasive or naturalized species. Fuel modification activities can include removal, partial or total replacement of existing plants with adequately spaced drought-tolerant and fire-resistant species, and thinning of existing native or ornamentals species.

Fuel Modification Zones are designed to protect homes from wildfire by limiting and reducing the amount of fuel available for a wildfire. The reduction in available fuel affects the flame lengths and amount of heat produced by the fire, as well as eliminating those areas in landscape where embers can ignite vegetation. Each zone should be designed so that the amount of fuel is reduced the closer to a structure you get. Additionally, the amount of moisture in the plants should increase the closer to a structure you get. Following all the fuel modification principles (removal, thinning, firewise landscaping, and maintenance) does not guarantee the survivability of a structure, but it does greatly increase its chances.

The erosive hillsides common in Southern California make it imperative to consider the potential for erosion and the need for slope stabilization. Every effort should be made to avoid the need to remove native vegetation from hillsides. Increasing the setback of any proposed structure from a slope will reduce the amount of work required on the adjoining hillside as well as improving the defensible space around the structure. Efforts should be made to keep as much of the existing native vegetation as possible. Native plants are better adapted to the sites and provide important wildlife habitat and protection from erosion. Erosion concerns, combined with the need to address water conservation measures, requires the careful selection of plant species as well as the placement of pathways, patios, retaining walls and other landscape features that can create a landscape which accomplishes more than just the goal of fire safety.

Defensible space can be accomplished in ways other than the modification of the vegetation. Paved, brick, gravel pathways, rock borders, dry streambeds, water features, swimming pools, or terraces made of non-combustible materials can contribute to a structure's defensible space. A number of things can also be done to structures themselves to increase their survivability. Many of these items are now incorporated into State and local Fire Codes. For information on what you can do to make your structure safer, contact your local Fire or Building Department.

What is Firewise Landscaping?

Firewise Landscaping is an overall approach to making the landscape around a structure more fire safe. The keys to successful Firewise Landscaping are plant selection, plant placement, and maintenance. Any plant will burn when exposed to severe enough conditions, but plants which are high in **fuel moisture** and low in available fuel will be more resistant to fire than those that contain dead material, volatile oils or resins, and low fuel moisture. By carefully spacing shrubs and trees, utilizing low groundcovers or mulch, and reducing mass plantings, the path of the fire to the home can be slowed greatly if not stopped. Plants must be spaced so that fire can not spread horizontally or vertically from plant to plant. **Fuel continuity** is a term for fuel which forms a continuous path. Horizontal continuity would result from native brush or other vegetation having a continuous path to a structure. Vertical continuity, or a **fuel ladder**, is continuity of fuel from surface fuels such as grass, groundcovers, or shrubs to aerial fuels like tree canopies. Regardless of how well landscaped a property might be, maintenance of plant material through fuel reduction and irrigation to maintain fuel moisture is necessary to keep it "fire safe." People are encouraged to incorporate low water use or **drought-tolerant** plant species in their designs and preserve the native vegetation on the site whenever possible. Local codes or ordinances may require applicants to submit landscape plans to other agencies for review of water conservation practices.

FUEL MODIFICATION ZONES

Most sites going through plan review will have three Fuel Modification Zones identified within the parcel boundaries for implementation in order to create the desired **Defensible Space**. These zones will be identified as Zone A, Zone B, and Zone C. The actual number and width of the zones will depend on several on-site and off-site factors. These zones are put in place to identify the required vegetation removal and thinning on the site and act as a guide for any currently planned or future landscaping. Additionally, landscaping and vegetation reduction along all site access roads will be reviewed. Fuel Modification Zones will be identified for the property under review and its access only, unless specific written permission is provided for easements that may be in existence. Any vegetation that needs to be addressed that is off site is the responsibility of the Fire Department's Brush Clearance Program. Careful pre-planning can help reduce the zone requirements and enhance Defensible Space.

ZONE A: SETBACK ZONE

This zone will normally extend out to 20', but sometimes up to 50' or more from the edge of any structures. Zone A is directly adjacent to all reviewed structures on the project and provides access and defensible space for fire suppression activities as well as a buffer from a fire's convective and radiant heat. This zone should offer protection from intense flames through either properly maintained irrigated plants with high moisture content, or through walkways, gravel, stone, paved surfaces, or water features that help create breaks in the path of fire. Keep at least a few feet or more of area open between plants and the foundation, especially if the siding material is combustible. Overhanging decks or fencing constructed out of flammable materials can be a key conduit in carrying fire from adjacent wildland areas to the structure.

Specific Requirements:

- Extends beyond the edge of any combustible structure, accessory structure, appendage or projection where review is required by the Fire Code.
- Irrigation by automatic systems shall be provided to landscaping to maintain healthy vegetation with high live fuel moisture and greater fire resistance.
- Landscaping and vegetation in this zone shall consist primarily of green lawns, ground covers, mulch, adequately spaced small shrubs, and hardscape/non-flammable

materials. The overall characteristics of the landscape shall provide adequate defensible space in a fire environment.

- Plants in Zone A shall be inherently highly fire resistant and spaced appropriately. Species selection should be made from the Approved Plant List. Other species not on the plant list may be utilized with prior approval.
- This zone will typically contain any moderate to high water use plants proposed for the site.
- Small trees may be utilized when appropriately spaced.
- Large trees are generally not appropriate for use within Zone A.
- Target species will typically not be allowed within 30' or more of combustible structures, and may require removal if existing on site.
- Vines and climbing plants shall not be allowed on any structure under review or any wall, fence, or other similar features attached to or in close proximity to the structure under review. Attached patio covers and other similar structures added after review or inspection require review and will not be allowed to have any vines or climbing plants.
- Existing native vegetation shall be modified by thinning and removal of species constituting a high fire risk; including but not limited to laurel sumac, chamise, ceanothus, sage, sage brush, buckwheat, and California juniper. Isolated specimen native shrubs may remain if approved on the Landscape Plan. Refer to the Undesirable Plant List for additional species.
- Trees should be limbed up to at least 6 feet above bare earth and a minimum of 3 times the height of underlying plants.
- This zone should be free of any combustible structures such as patios, decks, trellises, and wooden fences.



Vines attached to structures provide a conduit for fire

ZONE B: IRRIGATION ZONE/TRANSITION ZONE

This zone extends from edge of Zone A up to 100' from structures. Irrigated areas extending past 100', such as manufactured slopes, will need to meet the spacing and planting requirements for this zone. This is the zone just outside and adjacent to the Setback Zone. It may have detached structures, and may contain some native vegetation if spaced according to planting guidelines that create a transition to the native brush and the Thinning Zone. A large percentage of existing vegetation may be removed and replaced with irrigated fire resistant and drought resistant plants. In steeply sloped areas, a high priority should be assigned to maintaining plants that will help control erosion and slope failure. If planting is considered for these areas it should be phased in during the construction and done carefully and gradually so the slope is not left bare.

Specific Requirements:

- Extends from the outermost edge of Zone A up to 100' from structure.
- Landscaping and vegetation in this zone shall typically consist primarily of green lawns, ground covers, and adequately spaced shrubs and trees. The overall characteristics of the landscape shall provide adequate defensible space in a fire environment.
- Landscaping along access roads required for slope stabilization as part of a grading plan that extends past 100' from a structure, should typically follow the requirements for Zone B.
- Irrigation by automatic systems shall be provided to maintain healthy vegetation and increase fire resistance.
- Plants in Zone B should be fire resistant and spaced appropriately. Species selection should be made referencing the Appendix: Plant List. Other species may be utilized subject to approval.
- Existing native vegetation shall be modified by thinning and removal of species constituting a high fire risk; including but not limited to laurel sumac, chamise, ceanothus, sage, sage brush, buckwheat, and California juniper. Isolated specimen native shrubs may remain if approved on the Landscape Plan. Refer to the Undesirable Plant List for additional species that should be modified and/or removed.
- Trees should be limbed up to at least 6 feet above bare earth and a minimum of 3 times the height of underlying plants.

ZONE C: NATIVE BRUSH THINNING ZONE

This zone, if applicable, may consist mostly of native plants with proper thinning and spacing according to the guidelines and vegetation reduction requirements of the Fire Code. The objective is to thin the density of the vegetation and reduce the amount of fuel in order to slow the rate of fire spread, reduce flame lengths, and reduce the intensity of the fire before it reaches the irrigated zones or the structure.

Specific Requirements:

- Typically extends from the outermost edge of Zone B up to 200' from structures.
- Irrigation systems are not required for this zone. (Native plants are generally not compatible with regular, non-seasonal supplemental water.)
- Vegetation in this zone will mainly consist of modified existing native vegetation.
- Adequately spaced ornamental shrubs and trees are allowed if approved on the Landscape Plan, but are generally not recommended due to water conservation goals.
- Landscape planting with ornamental or native species to meet minimum slope coverage requirements associated with Grading Permits or city or County Hillside Ordinances is allowed. Irrigation should be in place at least as long as required to establish and naturalize the installed plants. The overall characteristics of the landscape shall provide adequate defensible space in a fire environment

- Existing native vegetation shall be modified by thinning and removal of species constituting a high fire risk; including but not limited to laurel sumac, chamise, ceanothus, sage, sage brush, buckwheat, and California juniper. Refer to the Undesirable Plant List for additional species that should be modified and/or removed.
- Remove of the lower 1/3 of large shrubs and all dead wood to reduce fuel loads.
- Trees should be limbed up to at least 6' above bare earth and a minimum of 3 times the height of underlying plant as outlined in the maintenance section.
- Native plants may be removed by reduced amounts as the distance from development increases.
- Plants in Zone C shall be spaced appropriately to meet the brush clearance requirements.
- General spacing for large existing native shrubs or groups of shrubs is 15' between the edges of the canopies.
- General spacing for existing native trees or groups of trees is 30' between the edges of the canopies. This will depend on the species, topography, and orientation on the site among other factors.

FIRE ACCESS ROADS

Planting proposed as part of a project along any public or private roadway that may be used for emergency access will be reviewed to ensure compliance with applicable fire code requirements and safety as part of the Fuel Modification Plan review.

Specific Requirements:

- Remove flammable growth for a minimum of 10' on each side of Fire Access Roads.
- Fire Access Roads, driveways and turnarounds shall be maintained in accordance with fire code. Fire Access Roads shall have unobstructed vertical clearance for a width of 20'.
- Landscaping and native plants adjoining fire access roads shall be appropriately spaced and maintained to provide safe passage in wildland fire environments.
- Trees should be planted so that, at maturity, they will not overhang any access road leading to a required emergency vehicle turnaround.



Fire access road clearance

OFF SITE FUEL MODIFICATION

A wide variety of conditions may result in the required fuel modification not being fully achieved within the property boundaries. Property owners are not required to extend their fuel modification on to adjacent property. However, they are encouraged to collaborate with adjacent private landowners and public agencies to find ways to extend fuel modification or brush clearance activities in ways that benefit everyone in the community. Written documentation will need to be submitted as proof before any off site modifications will be taken into consideration during plan check.

FACTORS DETERMINING THE WIDTH OF FUEL MODIFICATION ZONES

The factors considered in deciding the distance away from structures needed for fuel modification varies for each site. The Zone A and Zone B Irrigated Zones encompass the minimum 30' to 50' of required removal of all highly flammable brush required by the Fire Code. This is the most commonly landscaped area around most structures. It may also include an additional 50' to 70' of Irrigated Zone identified on the plan that acts to guide any proposed planting. No irrigation is required as part of the Fuel Modification Plan, but any on site planting is required to be irrigated. Zone C will typically coincide with the requirement to thin from 30' to 200' from any structure. However, if any of the conditions discussed below imply a greater hazard, the distances can be increased to a maximum of 200' from structures. This distance will be determined during the initial fuel modification plan review and be reflected in the specific notes supplied after the review. Fire Code requirements for the removal and thinning of vegetation will be the minimum requirements on a site.

Fuel modification distances are site specific, designed for severe fire weather scenarios, and are not intended to be a blanket requirement for all sites. On slopes, phasing in the planting of low-volume, fire retardant, water conserving/drought tolerant plants and/or thinning existing deep rooted plants must be balanced against the potential for soil erosion and slope failure. Good design and planning up front is a good investment. The majority of costs associated with a landscape within a fire-prone area will be devoted to maintenance, not installation. After the initial removal and thinning of brush on any given site, it will be subject to annual inspections as part of the Brush Clearance Program and regular inspections by Fuel Modification personnel that ensure compliance with the approved plan.

Building and environmental factors used by the Forestry Division to establish distances for fuel modification include but are not limited to:

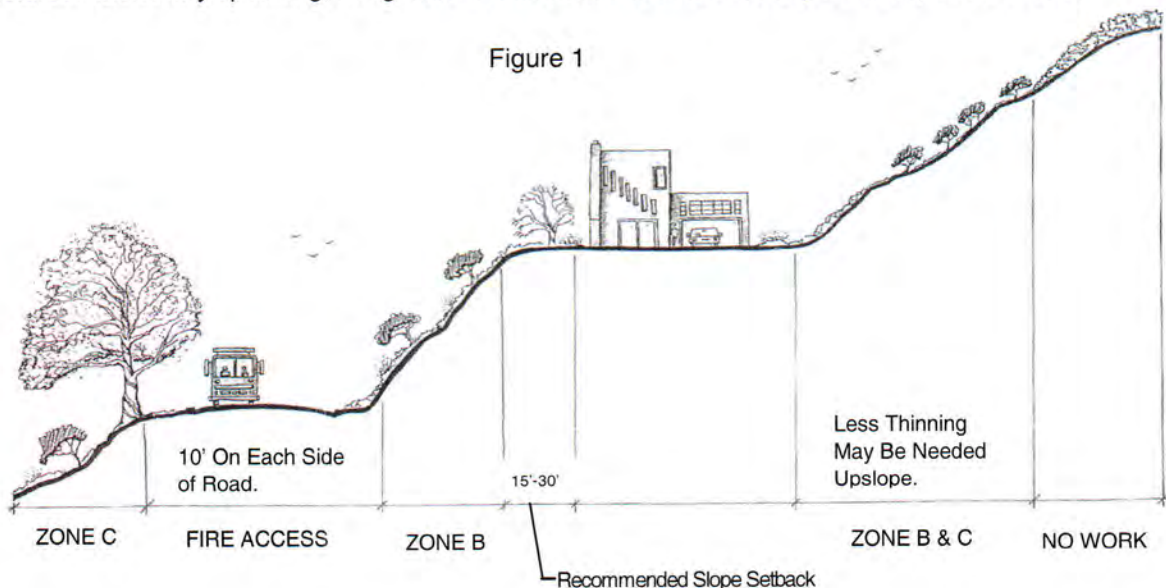
- Structures: How well do all buildings meet current Hazard Severity Zone requirements? How does the placement of windows relate to the topography and proposed planting on the site? The better the design for fire safety, the more effective fuel modification zones will be. Though certain structural or added features may help prevent structure ignition in a wildfire, minimum vegetation removal and thinning code requirements will have to be met.
- Fuels: Is the existing vegetation grassland, coastal sage scrub, oak woodland, or chaparral? Areas of grassland, less dense coastal sage scrub, or oak trees without understory plants will require a shorter distance of modification initially than oak woodland with chaparral growing underneath or dense unburned stands of chaparral, or flammable ornamental vegetation such as some species of eucalyptus trees. Plans will be reviewed based on what the expected climax plant community is for each site. Areas recently burned may have a much different fuel type for the years immediately following the fire. The actual required clearance and thinning distance may increase as the site fuel and neighboring fuels change and mature. This requirement will never go beyond what the current fire code requires for vegetation removal and thinning.
- Slope: Steeper slopes, especially below structures or developments will require greater distances for fuel modification. Slopes where, because of their steepness, proper vegetation removal or thinning can not be achieved may require additional elements be added in the landscape to help mitigate for the lack of defensible space. The distance of a structure from the slope will play an important part of the review process.

- **Aspect:** Combined with steepness, the direction the slope is facing will be an important factor. Slopes facing south, while they may have thinner soils and less dense vegetation, are extremely hot and dry, especially during high fire danger periods. Because of the east-west formation of the San Gabriel and Santa Monica Mountains south facing slopes are very common in Los Angeles County, so this situation will often apply.
- **Fire Topography:** Structure distance from slopes, chimneys, saddles, and steep canyons. Proximity to any of these landscape features increases the need for fuel modification zones to be extended. These features often guide fires towards structures by directing the local and seasonal winds.
- **Fire History/Potential:** Historical fire patterns are important to consider when establishing fuel modification zones. Both the frequency and intensity of fires in the area must be considered. Information on fire history can be obtained from various sources, including the Fire Department website.
- **Weather:** Local and seasonal winds play an important part of the review process. Much of Los Angeles County is prone to Santa Ana winds. These winds can reach near hurricane speeds and push wildfires at incredible speeds. They can also deposit embers far ahead of the fire itself, in some cases, up to miles ahead of the main fire line. These winds typically correspond with the height of our fire season.
- **Adjacent properties:** Structures should be situated as far as possible from certain County, State, or Federally owned lands that may be exempt from clearance requirements. The presence of endangered or protected species on adjoining land can also affect the plan review and zone delineations.

Current code requirements for subdivisions including access, fire flow, fire sprinklers, water storage and fire resistive construction techniques will be considered when establishing the final fuel modification requirements for a project.

PRE-PLANNING

Though planning codes and other requirements often guide the placement of structures, consideration of site topography and property lines when planning the location of proposed structures can play an important role in what will eventually become the Fuel Modification Zones. Situating a structure away from slopes, especially those below a proposed structure, will help minimize the amount of vegetation removal and thinning needed on the site. It is recommended that a setback away from the slope of at least 15 feet be in place for single story structures and a setback of at least 30 feet for two story structures. Generally speaking, the greater the structure is setback away from slopes the better.



On occasion, sites will have specific conditions that may limit the amount of fuel modification that can occur on the site. Every effort should be made in the planning process to avoid potential conflicts. Locating structures as far as possible from these conditions will be the expectation for each submittal. Plans that do not attempt to mitigate potential conflicts may not be approved as submitted. Placement of the structure to avoid sensitive species, protected habitat, riparian areas, or geologic hazards can also speed the approval process. Whenever possible, structures should be located on the site in such a way as to minimize the amount of clearance and disturbance to natural vegetation. In such cases where the full implementation of the Fuel Modification Zones is not possible, every effort should be made to place the proposed structures in such a way as to maximize the fuel modification on the property being reviewed.

- Special consideration can be given for rare and endangered species, geologic hazards, tree ordinances, or other conflicting restrictions as identified in the environmental documents submitted for project approval, if the plans indicate every effort has been made to avoid or mitigate for these conditions prior to submittal and the resulting plan is considered to be in compliance with all other Fire Code requirements.

Though fuel modification review can take place concurrently with other reviews, the placement of the structure will need to meet the applicable city, county, and or state requirements for structures located in the Wildland Urban Interface as outlined in the California Code of Regulations.

ALTERNATIVES TO ZONES

In extreme situations or where the desired zones are not capable of being implemented, alternatives to the typical requirements may be substituted. The installation of a wall made of cinderblock or other fire retardant material may be required as part of the Fuel Modification Plan. If required as part of the approval process, its installation would be required prior to occupancy inspection. Because such alternatives are mitigations to reduce a hazard that can be addressed in no other way, they will not be allowed in place of the typical requirements where they can be implemented effectively.

If the Fire Department concludes an extreme fire hazard exists on the property, additional mitigation measures may be required. The Fire Department shall review each project on a case-by-case basis to identify extreme fire hazard conditions including, but not limited to: wind direction and velocity, fuel load, neighboring land uses, terrain, access for firefighting equipment, adequacy of water supply and delivery systems and construction standards. Generally, the Santa Monica Mountains and the south facing slopes of the San Gabriel Mountains are considered to be extreme fire hazard areas.

FIREWISE LANDSCAPING DESIGN AND IMPLEMENTATION

Once the Fuel Modification Zones for any given project have been determined, they will act as a general guideline for any proposed or future landscaping. Every landscape plan will be reviewed for the appropriate species selection, placement, and distance from structure as designated on the approved plant list. As discussed, the keys to successful Firewise Landscaping are plant selection, plant placement, and maintenance.

Implementation of the approved Landscape Plan for individual structures should be completed prior to inspection and occupancy. All landscaping installed by developers within residential tracts or commercial developments must be installed prior to inspection and occupancy. All vegetation removal and thinning for hazard reduction must be completed prior to occupancy and should be implemented during construction. Changes to the approved Landscape Plan or changes to the site that affect the approved Fuel Modification Zones must be approved prior to implementation.

DESIGN CONSIDERATIONS

The overall layout of the landscape and its features can play an important role in the safety of any given structure. Locating turf areas, pools, sports courts, or terraces between the structure and the areas of greatest potential hazard can significantly increase the defensible space around the structure. Meanwhile, wooden fences, hedges, and planted “screens” can act as a wick and transfer fire from the adjacent wildland areas to the structure. The following are just some of the things that will be looked at during the review of the landscape plan.

- Vines and other climbing plants will not be allowed on any reviewed structure. Applying something that will burn directly on the structure can significantly affect its integrity when exposed to fire. Vines provide a receptive fuel directly on the structure, that when ignited, require immediate attention of firefighting resources. Features designed to hold vines should be located outside of Zone A.
- Generally speaking, large shrubs and hedges will not be allowed directly adjacent to structures. If ignited, large shrubs and hedges could allow for prolonged direct flame contact with windows, eaves, vents, roofs, and other parts of the structure not designed for this type of exposure. Hedges can accumulate large amounts of dead fuel through the process of routine trimming to maintain a shape or size. Animal nests can often be located in such plantings and provide an excellent receptive fuel for embers.
- Screening the view of neighboring structures or unsightly landscape features is not always in keeping with fire safety. Spacing requirements must be followed. Variances may be requested and will be reviewed on a case by case basis.
- Plants and mulches should be avoided directly against the structure. Providing space between plants and the structure can prevent direct flame contact with the structure itself. Because mulches and turf can burn, a minimum of one foot of rock or gravel should be placed around the perimeter of each structure, especially where combustible materials are used for siding. This can have the added benefit of improving drainage around the foundation and make for easier maintenance.



Large shrubs are not allowed in Zone A

PLANT SELECTION

Plants proposed for use on a Fuel Modification/Landscape Plan submitted for review, should be selected from the approved plant list. In general, plants with the highest fuel moisture should be used in the closest proximity to the structures. In addition to preventing the spread of fire from the wildland to a structure, plants must also be able to resist ember showers that accompany fires. Embers can travel miles ahead of wildland fires and start new fires wherever a receptive fuel is found. Structures that are not directly adjacent to the wildland are often destroyed due to the ornamental landscaping around them.

There are thousands of plants available from nurseries, arboretums, native plant societies, and botanic gardens in Southern California. Recent awareness to the threat of prolonged droughts has brought about an increase in the availability of new varieties of many native and drought-tolerant plant species. These plants often share certain characteristics such as tough leathery leaves which reduce water loss, grey leaf coloration to reflect heat and light, or small hairs that help shade the leaf surface. It must be remembered, however, that many plants that grow well in Southern California are those that come from areas of similar climate around the world. Many of these plants, such as the ones that come from the Mediterranean region or Australia, are often just as flammable as our native species, or in some cases, more flammable. Rosemary (*Rosmarinus officinalis*) is a very popular and widely planted ornamental species that is highly flammable and should not be planted directly around homes. It is very high in oil content and over time builds up a large amount of dead material. Shorter varieties do exist that can be useful for planting on slopes, but even these are inappropriate for areas in close proximity to structures. Whenever feasible, plants native to any given area should be utilized. They will typically require less water and are already adapted to the local soil conditions.

Plant height and width will also help determine how a plant can be used in the landscape. Small shrubs, two feet or less in height, are very useful in a firewise landscape because they generally provide less fuel and produce shorter flame lengths than larger plants. Medium shrubs, ranging from 2' to 5' in height should be used sparingly near structures, while large shrubs should be avoided in close proximity to structures in most cases. Plants that spread or mound tend to build up greater amounts of dead material, while those that are more upright or maintained with branches limbed up off the ground are easier to do maintenance around. The buildup of dead leaves under shrubs or groundcovers provides a receptive fuel for embers. Hedges should be avoided, the process of hedging produces large amounts of litter and dead material that tends to become lodged within the hedge itself. Hedges, and all shrubs in general, tend to catch debris in the form of leaves and needles from any overhanging or nearby tree.

Plants identified as acceptable for use in any given zone must still meet spacing requirements and be in the appropriate quantity. One or two of a given species may be acceptable for use while one hundred may not. Other plants may be approved for use if they are determined to be appropriate for the proposed zone. Some plants will be approved only with special conditions. An example of this would be a hedge that must be maintained at a certain distance away from the structure, or at a certain height or width. Some plans may also require submittal to cities or design review committees to make sure the selected plants are on other approved lists or meet neighborhood requirements. The following list is just some of the items that will be considered in the review process.

- Are plants appropriate for the designated Fuel Modification Zone?
- Are plants appropriate for the region? Plants that are not suited for the weather and climate in any given area may get denied due to the potential of becoming a hazard should they become damaged or die.
- Do the selected plants require a significant amount of maintenance to keep a desired or required size?
- Are the plants grouped into hydrazones according to water needs?
- What is the ownership of the property and how will it be maintained? Is the plant being placed on private property, Homeowners Association property, or Landscape

Maintenance District maintained areas.

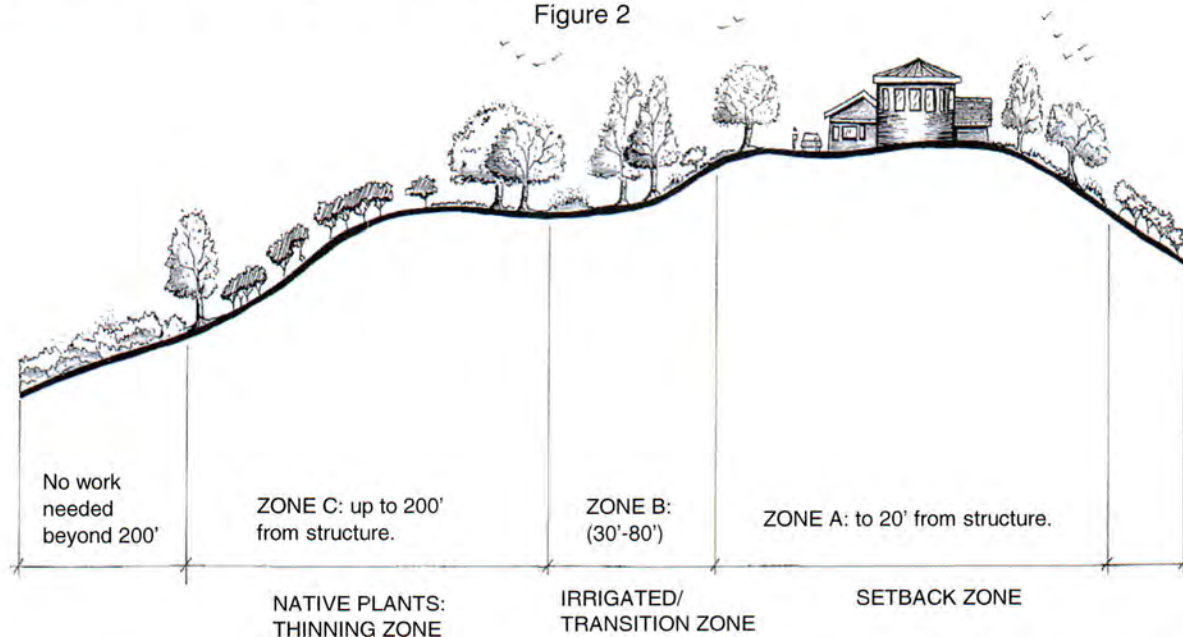
- Are the plants drawn at the appropriate size and spaced accordingly?
- Are the groundcovers selected naturally low growing or do they require a lot of maintenance to keep at a certain height. Groundcovers on flat areas around structures should be kept at a maximum of 6" in height. Any groundcover within 20' of a structure must be kept at a maximum height of 6". Those requiring maintenance will build up dead material at a much faster rate.
- Is the plant considered invasive on any state, regional, or County lists?
- Does the plant tend to be very aggressive or easily re-seed itself in irrigated areas?

For a list of the plants to avoid and those approved within the various Fuel Modification Zones, see the lists in the appendix.

PLANT PLACEMENT

Plant selection and placement go hand-in-hand in the design process. Once plants have been selected for a project, the placement on the landscape plan will need to follow the general spacing guidelines and be placed so they do not endanger the structure or any neighboring structures. Although not a part of the required review, the location of any neighboring structures will be considered when reviewing the landscape plan. Below are plant placement factors.

Figure 2



- Are individual trees or groups of trees spaced in such a way as to prevent horizontal and vertical continuity of fuels?
- Are trees drawn to the appropriate size and placed in such a way so that they will not overhang structures or come within 10 feet of a chimney outlet?
- Are trees placed far enough from required emergency access roads so that Fire Code requirements for unobstructed vertical clearance is provided?
- Are low fuel plants being planted along the access road?
- Does the placement of plants along the access road block the vision of emergency vehicles?
- Are plantings at the exit of driveways, roads, or parking areas blocking the vision of vehicles?
- Are proposed trees large enough to accommodate what is intended to be planted

underneath them? To prevent ladder fuels, large shrubs and hedges should not be placed under small or low branching trees. As an example, a toyon or other large shrub would be unacceptable planted under most tree species. Trees should be limbed up to a height at least three times the height of the plants placed underneath them. Additional height may be required depending on the species.

- Is a hazard being created by placing certain plants together? Though similar in requirements, the combination of some species increases the hazard on the site to unacceptable levels. Needle drop from pine trees, in general, requires a lot of maintenance. If those needles fall on and into shrubs or groundcover, the amount of dead material can build up very quickly and create a maintenance issue. For this reason, some trees are not recommended for heavily planted areas.
- How does the placement affect or relate to previously approved plans for the neighboring structure, hillsides, or street trees?

SPACING OF PLANTS

The spacing of plants will be determined by taking several factors into consideration. The three major considerations are:

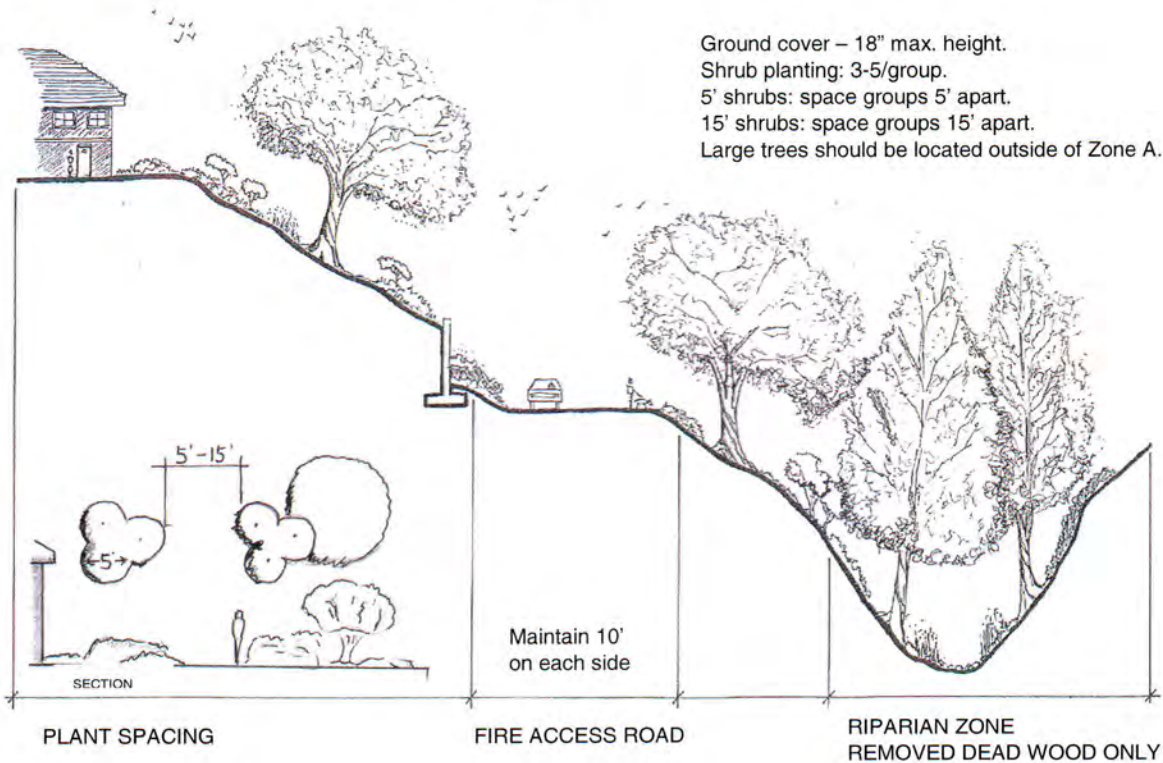
- (1) Is the area irrigated and planted with ornamental vegetation or a thinning zone?
- (2) What is the expected size of the proposed or existing vegetation?
- (3) What is the slope of the site? Because fire travels much faster uphill than down or on flat surfaces, spacing of shrubs and trees below a structure will typically be greater than in other areas.

On slopes, the species present or proposed and steepness of the slope itself will typically be the determining factors for spacing. The spacing of shrubs on slopes will vary, but will generally follow a formula of space between shrubs or group of shrubs being at least three times the expected height of the species to be planted or native shrub existing on the site. Large shrubs and trees or groups of large shrubs and trees should have at least 15 feet of open space between the edges of adjoining canopies if the trees are aligned horizontally on the slope parallel to a structure. This spacing would increase based on the specific species selected and if the trees were oriented with the slope and aligned towards a structure. Distances of 30 feet or more between the edges of canopies could then be required.



Large shrubs with 15'-30' of spacing

Figure 3



Many other factors will also play a role in the determination of acceptable spacing. These can include the surrounding vegetation, historical fire corridors, planting requirements for slope stabilization, and prevailing or Santa Ana winds. As with other parts of the review process, determinations are made after careful review of the site and with extreme fire behavior in mind. The following list includes items that should be considered when laying out the landscape.

- Utilize slope distances for all measurements.
- During early stages of revegetation, plants are small and may be planted, with prior approval, in increased densities to establish erosion control measures; however, as these plants mature and increase in size they must be thinned to meet fuel modification standards. A schedule will need to be approved with the Landscape Plan.
- Select plant material which will produce an easily maintained permanent cover, effectively controlling erosion.
- Consider utilizing deep-rooted plants needing limited watering.
- Limit use of plants, which are known to be especially flammable throughout your property.
- Limit use of large woody plants.
- Limit use of plants which develop deciduous or shaggy bark.
- Limit use of plants which develop dry or dead undergrowth.
- The term "fire resistant" may be misleading. As previously discussed, all plants will burn if there is enough heat and other conditions are right. However, those plants high in water content and those that are free of attributes that make them highly flammable, will tend to be more fire resistant when maintained properly.
- Plants and trees must be individually planted or grouped, and spaced and maintained in such a manner that they do not form a means of transmitting fire from native growth to the structure.
- Select plants from the approved list for each zone and geographical area. Other species will be reviewed on a case-by-case basis. Except for dwarf varieties or mature trees small in stature, trees are generally not recommended within Zone A for reasons which

go beyond fire issues and are therefore not included in the planting guide. Tree canopies may extend into Zone A when planted outside the zone

- Limit massing of vegetation adjacent to structures, especially under eaves, overhangs, etc.
- Avoid planting under decks, especially those made of combustible materials.

Plants should fit the location and situation. Large trees should not be planted under or near utility lines. Low branching and wide trees should not be planted near roads or driveways where they could interfere with emergency vehicles. Typically, trees should be planted no closer than a distance of one half of their expected mature width away from roads or driveways and structures.

MAINTENANCE

Maintenance is by far the most important factor when it comes to keeping a structure fire safe. Landscape Plans are approved based on the requirement that installed plants must be maintained. Plans are approved under the premise that **when** the installed landscape burns, the structures will survive because there is not enough fuel adjacent to the structure to ignite it or that the vegetation is isolated in such a way that it is highly unlikely to ignite without other fuel being present. Only through maintenance can this be achieved. Adding plantings not on the approved landscape plan can compromise fire safety.



Maintaining approved landscape will ensure defensible space

Routine maintenance shall be regularly performed in all zones. The following is a checklist of commonly required maintenance items. It is intended only as a guide and should not be considered all inclusive.

- Removal or thinning of undesirable combustible vegetation and replacement of dead or dying landscaping.
- Maintenance includes irrigation, and annual removal of weeds, dead materials, and other undesirable flammable vegetation required to keep the area in a fire safe condition as

- required by the approved Fuel Modification Plan and the Fire Code.
- Pruning and thinning to reduce the overall fuel load and continuity with other fuels.
- Pruning lower branches of trees and tree-form shrubs to 1/3 of their height (or 6' from lowest hanging branches to the ground) to help prevent fire from spreading and make maintenance easier. Trees with understory plants should be limbed up at least three times the height of the underlying vegetation up to height of 40'.
- Unless otherwise approved, ground covers shall be maintained at a height not to exceed 6" in Zone A and B, 12" is acceptable within 50' of a structure in Zone B if it is on a slope, and 18" in Zone B beyond 50'. Annual grasses and weeds shall be maintained at a height not to exceed 3".
- Accumulated plant litter and dead wood shall be removed. Debris and trimmings produced by thinning and pruning should be removed from the site or chipped and evenly dispersed in the same area to a maximum depth of 6". Chips should be large enough to prevent blowing around in the wind but small enough to avoid large gaps.
- Irrigation systems shall be maintained for operational integrity and programming. Effectiveness should be regularly evaluated to avoid over or under-watering.
- Conduct maintenance as needed to reduce fuel volume, eliminate weeds, remove dead vegetation, etc.
- Compliance with the Fire Code is a year-round responsibility. Enforcement will occur following annual inspection by the County of Los Angeles Fire Department, and as needed for specific hazards. Annual brush inspections are conducted, following the natural drying of grasses and fine fuels between the months of April and June, depending on geographic region. Inspection for compliance with an approved Fuel Modification Plan may occur at any time of year.
- Irrigation may be designed to supplement native vegetation and establish planted natives.
- Irrigation shall be directed away from native oaks and be placed outside the dripline.
- Provisions for continuous maintenance must be documented on the Fuel Modification Plan and Covenants, Conditions & Restrictions (CC&Rs), i.e., by Homeowners associations, property owners, or other entities.

Per the County Fire Code, off-site issues related to vegetation reduction are enforced by the local jurisdictional fire station or County Agricultural Commissioners Weed Abatement Division in conjunction with the County of Los Angeles Fire Departments Forestry Division, Brush Clearance Unit. Vegetation reduction enforcement issues on adjacent properties should be directed to the Brush Clearance Unit at (626) 969-2375.

LONG TERM MAINTENANCE ISSUES

Unlike building plans, Fuel Modification Plans are not "done" when the landscape is installed. The ornamental plants and any surrounding natural vegetation will continue to change forever. Like all living things, plants have a variable life expectancy based on a number of factors. Regardless of the cause, plants will die and need to be replaced within areas designated as Fuel Modification Zones. Additionally, homeowners may want to change their landscaping or sell their property to someone that wants to change the landscaping. Prior to occupancy being granted, each property is required to have Covenant and Agreement notarized and recorded tying the approved Fuel Modification Plan to the parcel. This document notifies all future owners that there are approved plans that need to be followed or updated should changes be proposed. In order to maintain defensible space on the site, new plans will be required to be submitted. All proposed changes or additional landscaping will need to conform to the most current guidelines and plant lists. Because of the potential for change in ownership and the required long term maintenance issues, each project will be monitored on a regular basis to ensure compliance with the approved plans. Properties found to be in non-compliance with the approved plan will be issued a notice to correct any violations. If the identified violations are not corrected, the property owner will be subject to penalties and liens placed on the property.

ENFORCEMENT AND ANNUAL REVIEW

Compliance with the Fire Code is a year-round responsibility of the property owner, and all areas must be maintained in accordance with the project assessment notes, Long-Term Maintenance Agreement, and the most recently approved Final Fuel Modification Plan reviewed for the project. Enforcement will occur following inspection by the Fire Department's Fuel Modification Unit. Regular inspections will be performed to ensure compliance with the approved plan. Failure to comply with the Fuel Modification Plan requirements may result in an administrative fine, direct assessment, possible legal action, and liens being placed on the property. Ongoing maintenance shall be conducted regardless of the date of potential inspections by the Fire Department. Inspections for fuel modification compliance can be conducted at any time of year and do not always coincide with the annual inspections performed by the jurisdictional fire stations that are generally conducted following natural drying of fine fuels. The fire station defensible space inspections typically occur between the months of April and July. Activities related to maintenance include maintenance of the irrigation system, replacement of dead or dying vegetation with approved plants, removal of invasive or undesirable species, removal of new growth to maintain proper standards of thinning, and other activities that maintain compliance with the approved Fuel Modification Plan. Because the Fire Code and standards relating to vegetation reduction and defensible space may change from year to year, all properties are required to meet the minimum standards, should these be more stringent than those originally prescribed for the property.

The property owner(s) agree to be responsible for the long-term maintenance of the Fuel Modification Plan. Notification of fuel modification requirements are to be made upon sale to new owners. Proposed changes to the approved Final Fuel Modification Plan must be submitted to the Fuel Modification Unit and approved, prior to implementation.



Long term maintenance is a year round responsibility

SUBMITTAL PROCESS

OVERVIEW OF THE SUBMITTAL PROCESS

If your proposed project, qualified remodel, or subdivision is within a Fire Hazard Severity Zone, you should have been notified in the form of the "Fire Hazard Severity Zone" plan check sheet, or "Plan Check Requirement" checklist during the initial submittal of your plans, that a Fuel Modification Plan will be required before the project approval or a building permit will be issued.

Fuel Modification Plans may be submitted by mail or in person to the Fuel Modification Unit. See the "Fuel Modification Plan Submittal Checklist" in Appendix VI for a list of items to be submitted. Submitted plans will typically go through a process of plan review that will include corrections being made and revised plans being submitted for approval. Once final approval is granted, implementation and installation of the Fuel Modification Plan must be completed and inspected before a Certificate of Occupancy will be issued for structures. A Covenant and Agreement document recording the approved plan to the property is also required.

Each plan that receives a PRELIMINARY or NOT APPROVED stamp is valid for a period of two years from the date it was reviewed. Plans receiving an APPROVED stamp are good indefinitely or until changes are submitted. Plans that need to be resubmitted due to: changes in the location, size, or number of structures, landscaping changes or additions, or other reasons will need to meet the current requirements that are being enforced and applied to similar properties.

SUBMITTAL AND ROUTING PROCEDURES

The actual procedures and route through the approval process will vary depending on the type of project being developed and whether the project falls within a city or unincorporated County.

SUBDIVISION AND ACCESS UNIT: Applicants submitting proposed tract or parcel maps for projects located in a Fire Hazard Severity Zone will be referred to the Fuel Modification Unit for approval of their Preliminary Fuel Modification Plan.

FIRE PREVENTION ENGINEERING: Applicants submitting proposed building plans for projects located in the Fire Hazard Severity Zone will be referred to the Fuel Modification Unit for approval of a Final Fuel Modification Plan. The requirement to complete a Fuel Modification Plan will be noted on the plan check sheet, during initial submittal.

OUTSIDE AGENCY APPROVALS: Approval of a fuel modification plan may also be required prior to approval of projects by agencies outside the Fire Department or from cities that need to know the impacts of the proposed project, prior to approval of a project or a Conditional Use Permit. In situations such as this, preliminary plan approval will be granted for use by the outside agency or city. After approval by the agency or city, a Final Fuel Modification Plan can be issued as part of the regular permitting process.

PRELIMINARY FUEL MODIFICATION PLAN - TENTATIVE MAP/PARCEL MAP PROCESSING: A Preliminary Fuel Modification Plan is required. All revisions and exceptions to the map must be approved on the Preliminary Fuel Modification Plan before release by the Fire Department.

FINAL FUEL MODIFICATION PLAN – TRACT OR SUBDIVISION: A Final Fuel Modification Plan is required for all vegetation being installed within the project boundaries that is considered "common area" or areas installed by the developer. The plan must be approved prior to the issuance of building permits.

FINAL FUEL MODIFICATION PLAN PRIOR TO BUILDING PERMIT ISSUANCE: A Final Fuel Modification Plan must be approved prior to the issuance of any building permit for applicable structures on individual parcels.

PRIOR TO ISSUANCE OF CERTIFICATE OF OCCUPANCY: Physical features, including plants and hardscape, of the approved Final Fuel Modification Plan must be installed, irrigated as required, inspected, and all vegetation reduction completed prior to occupancy for all developer installed landscapes. All planting required as part of a grading permit must be installed prior to occupancy inspection. All identifying tags must be left on the plants for the Inspector's review. This assists in the identification of different varieties of plants that were approved on the Landscape Plan. Applicants must request an inspection a minimum of seven working days in advance by contacting the Fuel Modification Unit. The Covenant and Agreement provided to the applicant must have the owners signature notarized, must be filed at the Los Angeles County Registrar-Recorder/County Clerk's Office, and a copy given to the Fuel Modification Unit prior to the inspection. Additionally, any project having a Homeowners Association or other type of association will be required to have the CC&Rs approved by the Fuel Modification Unit and recorded prior to any structures being released. All CC&Rs must contain the appropriate information detailing the requirements for fuel modification within the project.

SPECIAL SUBDIVISION REQUIREMENTS FOR DEVELOPERS: The builder/developer is responsible for providing new property owners, upon sale, with recorded CC&Rs when applicable, and disclosure statements identifying the responsibilities for maintaining the Fuel Modification Zone(s) within their property as defined in the approved Fuel Modification Plan. Purchasers of individual lots requiring Landscape Plan approval must be notified prior to the sale.

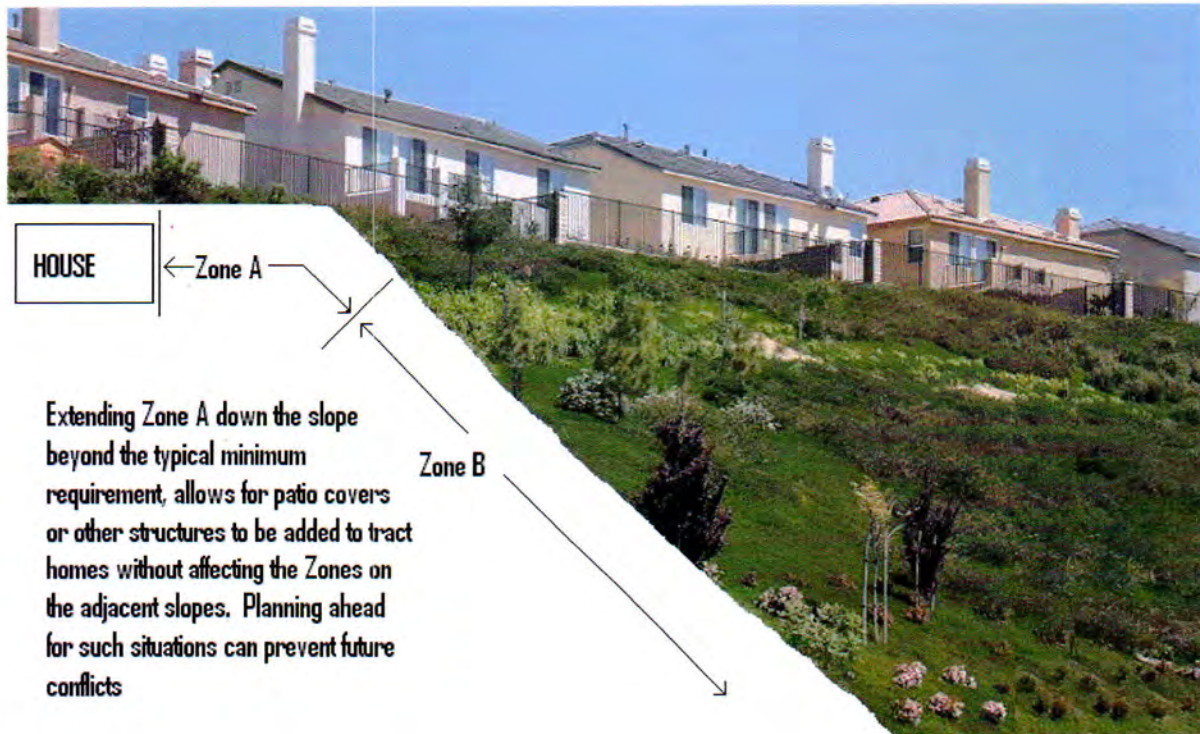
The CC&Rs must be reviewed prior to being recorded to ensure all the required, documentation as it relates to fuel modification is included in the document. The following items must be included in the document.

- The responsible parties for all Fuel Modification Zone maintenance identified.
- Zones identified by map, plan, or written description.
- Reference to the approved plan number and approval date.
- Identification of all lots within the project requiring individual landscape plan review.
- Applicable notes and requirements as indicated on the approved plan.
- Consequences for non-compliance with any approved plan.
- A copy of the latest Fuel Modification Plan Guidelines and Approved Plant List at the time of plan approval.
- Restrictions to additions that may affect the approved Fuel Modification Zones.

Changes or additions to the approved plan will require supplements to the CC&Rs be recorded to reflect those changes or additions.

All future plantings shall be in accordance with the County of Los Angeles Fire Department Fuel Modification Guidelines.

- Lots within the project may be required to submit plans to the Fuel Modification Unit prior to landscaping being installed
- Changes to landscaping in common areas or individual lots reviewed by the Fuel Modification Unit shall be approved prior to installation.
- Walls may be required on lots based on location of structure and proximity to slope (to be determined upon final tract submittal or individual lot review)
- Adjoining property owners are responsible for offsite brush clearance as required by the Fire Code.
- Zone C may be adjusted during inspection depending upon field conditions.



Typical HOA maintained slope

APPEALS OR CONFLICTS:

The review, approval process, and enforcement outlined in these guidelines are designed to assist an applicant through the fuel modification process. If questions of conflict arise, applicants may request assistance from the Fire Department's Brush Clearance Section Chief. If additional clarification is necessary or special circumstances arise, applicants may seek assistance or policy interpretation from the Chief of the Forestry Division.

APPENDIX I

GLOSSARY

CONDUCTION: Direct transfer of heat by objects touching each other.

CONVECTION: Transfer of heat by atmospheric currents; most critical under windy conditions and in steep terrain.

CROWN: Upper part of a tree or other woody plant, carrying the main branch system and foliage.

CANOPY: More or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees or other woody growth.

DEFENSIBLE SPACE: An area around the perimeter of structures or developments in the wildland urban interface, where vegetation has been removed, reduced, or otherwise modified or replaced in such a way that the safety of the structures is increased and an area is provided in which firefighting personnel can safely operate during wildfires.

DESIRABLE PLANT LIST: A list of plants exhibiting characteristics of low fuel volume, fire resistance, or drought tolerance which make them suitable for planting in areas of high fire danger.

DRIPLINE: Ground area at the outside edge of the canopy.

DROUGHT TOLERANCE: Ability of a plant to survive on little or no supplemental water for an extended period.

FINE FUELS: Fuels such as grass, leaves, and pine needles, which, when dry, ignite readily and are consumed rapidly. Also called flashy fuels.

FIRE BREAK: Removal of vegetative growth, usually during a wildfire, around housing developments to prevent a fire from spreading to the structures from open land or adjacent structures. See also Fuel Break.

FIRE HAZARD SEVERITY ZONE : Those geographic areas designated as Wildland Urban Interface (WUI) areas pursuant to Government Code Section 51178, Section 6402 and Chapter 26.150 of Title 26, County Building Code that contain the type and condition of vegetation, topography, weather, and structure density to increase the possibility of conflagration are separated into Very High, High, and Moderate Severity Zones.

FIRE RESISTANT: A comparative term relating to the ability of a plant to resist ignition which can have as criteria; its fuel volume, inherent flammability characteristics, and ease of fire spread. Several studies have been done under laboratory conditions which may or may not be applicable to the field during extreme fire weather. See also Fire Retardant.

FIRE RETARDANT (RETARDANCE): A term often used interchangeably with Fire Resistance, Any plant will burn with enough heat and proper conditions, but many succulents, because of a very high moisture content, may survive a wildfire or at least not burn in those conditions if healthy prior to the exposure to heat and or flames.

FUEL BREAK: A wide strip or block of land on which the native or pre-existing vegetation has been temporarily or permanently modified, so that fires burning into it can be more readily extinguished or diverted.

FUEL LOAD: The weight of fuels in a given area, usually expressed in tons per acre or the proximity of fuels to each other that governs the fire's capability to sustain itself.

FUEL MODIFICATION ZONE: A strip of land where combustible native or ornamental vegetation has been modified and partially or totally replaced with fire resistant plants.

FUEL MOISTURE CONTENT: The amount of water in a fuel, expressed as a percentage of the oven dry weight of that fuel.

FUEL VOLUME: The amount of fuel in a plant in a given area of measurement. Generally, an open-growing or thinned plant will be low in volume.

HORIZONTAL CONTINUITY: The extent or horizontal distribution of fuels at various levels or planes.

LADDER FUELS: Fuels which provide vertical continuity between strata. Fire is able to carry from surface fuels by convection into the crowns with relative ease.

LITTER: The uppermost layer of loose debris composed of freshly fallen or slightly decomposed organic materials such as dead sticks, branches, twigs, leaves, or needles.

PROBABILITY OF IGNITION: A rating of the probability that a firebrand (glowing or flaming) will cause a fire, providing it lands on receptive fuels. It is calculated from air temperature, fuel shading, and fuel moisture.

RADIANT HEAT: Transfer of heat by electromagnetic waves which can, therefore, travel against the wind. For example, it can preheat the opposite side of a burning slope in a steep canyon or a neighboring home to the ignition point.

SUBDIVISION: A parcel of land that is subdivided to create multiple individual lots for residential purposes in accordance with the State of California Subdivision Map Act.

TARGET SPECIES: Undesirable species, which are generally removed as part of the fuel modification plan (see undesirable species).

UNDESIRABLE SPECIES: Those species of plants with inherent characteristics, which make them highly flammable or invasive. These characteristics can be either physical or chemical. Physical properties affecting flammability include large amounts of dead material retained within the plant, rough or peeling bark, and the production of large amounts of litter. Chemical properties include the presence of volatile substances such as oils, resins, wax, and pitch. These plants are sometimes referred to as target species. Invasive species are also undesirable because of their ability to become naturalized in wildland areas, increase fuel loads, and degrade wildlife habitat.

VERTICAL CONTINUITY: The relationship of aerial fuels to surface fuels or fuels low to the ground.

WILDLAND URBAN INTERFACE (WUI): That line, area, or zone where structures and other human development meet or intermingle with wildland areas. State Responsibility Areas are separated into Very High, High, and Moderate Severity Zones. Very High Severity Zones within the Local Responsibility Areas are also part of the WUI.

APPENDIX II

PLANTING, SPACING, AND MAINTENANCE INFORMATION

Information:

- Utilize slope distances for all measurements.
- Maintenance includes irrigation and annual removal of weeds, dead materials, and other undesirable flammable vegetation required to keep the fuel modified area in a fire safe condition as required by the approved Fuel Modification Plan.
- During early stages of revegetation, plants are small and may be planted in increased densities to establish erosion control measures; however, as these plants mature and increase in size they must be thinned to meet fuel modification standards.
- The term "fire resistant" may be misleading. All plants will burn if there is enough heat and other conditions are right. Vegetative fire resistance may be enhanced through consistent irrigation.

General Requirements:

- Select plant material which will produce coverage of permanent planting effectively controlling erosion.
- Consider utilizing deep-rooted plant material needing limited watering.
- Limit use of plants, which are known to be especially flammable, throughout your property.
- Limit use of plants which develop large volumes of foliage and branches.
- Limit use of plants which develop deciduous or shaggy bark.
- Limit use of plants which develop dry or dead undergrowth.
- Recommended minimum spacing is 30 feet between canopies for trees and 15 feet or three times the height of large shrubs. Limited grouping or alternative spacing may be approved.

Specific Requirements:

- Plants and trees must be individually planted, spaced and maintained in such a manner that they do not form a means of transmitting fire from native growth to the structure.
- Select plant species from the approved plant list for each zone and geographical area. Other species will be reviewed on a case-by-case basis. Except for dwarf varieties or mature trees small in stature, trees are generally not recommended within Zone A for reasons which go beyond fire issues and are therefore not included in the planting guide. Tree canopies may extend into Zone A when planted outside the zone
- Limit massing of vegetation adjacent to structures, especially under eaves, overhangs, decks, etc.
- Provisions for continuous maintenance must be documented on the Fuel Modification Plan and CC&Rs, i.e., by Homeowners Associations, property owners, or other entities.
- Conduct yearly maintenance to reduce fuel volumes, eliminate weeds, remove dead vegetation, etc. prior to annual brush inspections.
- Irrigation shall be designed to supplement native vegetation and establish planted natives and ornamentals.
- Irrigation shall be directed away and placed outside the dripline of native oaks

Care should be taken to avoid erosion problems created or enhanced by total vegetation removal. In areas where target species comprise the total vegetation, partial removal is recommended with replacement planting using desirable species as the long-range goal. Avoid using shallow rooted ground covers on steep slopes. Ice Plant, while an effective ground cover on flat surfaces, would be undesirable on a steep slope because its shallow rooted nature may cause it to slide off the slope if the root zone becomes saturated during a rainstorm, exposing soil to erosion.

APPENDIX III

UNDESIRABLE PLANT LIST

TARGET PLANT SPECIES - Certain plants are considered to be undesirable in the landscape due to characteristics that make them highly flammable. These characteristics can be either physical or chemical. Physical properties would include large amounts of dead material retained within the plant, rough or peeling bark, and the production of copious amounts of litter. Chemical properties include the presence of volatile substances such as oils, resins, wax, and pitch. Certain native plants are notorious for containing these volatile substances. Plants with these characteristics should not be planted close to structures in fire hazard areas. Should these species already exist within these areas, they should be removed because of the potential threat they pose to structures. They are referred to as target species since their complete or partial removal is a critical part of hazard reduction. The following is a partial list of plants that should be avoided near structures.

UNDESIRABLE PLANT SPECIES (TARGET SPECIES)

Natives:

Adenostoma fasciculatum – Chamise
Adenostoma sparsifolium – Red shank
Artemisia californica – California Sagebrush
Eriogonum fasciculatum – Common Buckwheat
Salvia sp. – Sage, native species

Ornamentals:

Cortadera sp. – Pampas Grass
Cupressus sp. – Cypress
Eucalyptus sp. – Eucalyptus*
Jasminum humile – Italian Jasmine
Juniperus sp. – Juniper*
Pinus sp. – Pine
Plumbago auriculata – Cape Plumbago
Rosmarinus officinalis – Rosemary*
Tecoma capensis – Cape Honeysuckle

* Except as permitted in the planting list

INVASIVE PLANT SPECIES

Other plants may be considered to be undesirable due to their ability to naturalize in wildland areas and become pests, because they are invasive in the landscape, or because they are an aggressive spreading or climbing species that out compete other plants and add to the fuel load on site. These types of plants should be avoided, especially in sensitive riparian or coastal areas where they may become established and compete with native vegetation. Applicants may be required to remove these plants where they occur. The list below contains just a few of the most commonly used plant species that should not be planted due to their invasive nature. For lists of additional species considered to be invasive that should be avoided, visit the California Invasive Plant Council website at www.cal-ipc.org and <http://weedwatch.lasgrwc.org/matrix.html>.

UNDESIRABLE PLANT SPECIES (INVASIVE SPECIES)

Carpobrotus edulis – Hottentot Fig
Cortadera sp. – Pampas Grass
Cytisus sp. – Broom
Eucalyptus globulus – Blue Gum
Hedera canariensis – Algerian Ivy
Pennisetum setaceum – Fountain Grass – including all cultivars and varieties
Phoenix canariensis – Canary Island Date Palm

Schinus molle – California Pepper Tree
Schinus terbinthifolius – Brazilian Pepper Tree
Vinca major – Periwinkle
Washingtonia robusta – Mexican Fan Palm



Highly flammable species should not be planted near structures

APPENDIX IV

APPROVED PLANT LIST

This plant list is provided as a suggested, but not exclusive, guideline for Fuel Modification and Firewise Landscapes within Los Angeles County. Plants not listed (grasses, annuals etc.) may be used if approved on the Landscape Plan. Any conflicts with other County or local ordinances need to be worked out prior to plan approval. Plants approved on any given plan are for that specific species, in that approved location. Moving plants to other areas of the site, or increasing the number of plants may result in the need for an additional submittal and approval.

The plant list is arranged by plant type and includes categories for the acceptable Fuel Modification Zone, water needs, size, and appropriate geographical area for planting. A comment code is included to assist in plant selection and maintenance requirements.

DESIRABLE QUALITIES FOR LANDSCAPE PLANTS

- Ability to store water in leaves or stems.
- Produces limited dead and fine material.
- Extensive, deep root systems for controlling erosion.
- Not considered invasive.
- Ability to withstand drought.
- Prostrate or prone in form.
- Ability to withstand severe pruning.
- Low levels of volatile oils or resins.
- Ability to resprout after a fire.
- Minimal maintenance requirements.

PLANT LIST LEGEND

GEOGRAPHICAL AREA	WATER NEEDS	EVERGREEN/DECIDUOUS
C-Coastal	H-High	E-Evergreen
IV-Interior Valley	M-Moderate	D-Deciduous
D-Deserts	L-Low	E/D-Partly or Summer Deciduous
	VL-Very Low	

ZONES AND DISTANCE AWAY FROM STRUCTURES

A letter under the zone column corresponds to the appropriate zone location for that particular plant. A number on the list denotes the minimum distance allowed from any structure. Example: "A, B-15" would indicate the plant could be planted in Zone A, but should be planted no closer than 15' from a structure. If just the letter B is present, this plant would typically be appropriate for planting anywhere within Zone B.

Trees should typically be planted no closer than one half their expected mature spread away from structures and roads or driveways that are the access routes for emergency vehicles. Example: If a particular species of tree potentially reaches 30' in diameter, it should be planted no closer than 15'.

Zone A: Setback Zone – normally extends to 20' but sometimes up to 50' from structures.

Zone B: Irrigated/Transition Zone – extends from the edge of Zone A up to 100' from structures.

Irrigated areas extending past 100', such as manufactured slopes, will need to meet the spacing and planting requirements for this zone in most cases.

Zone C: Thinning Zone – thinned native vegetation extending up to 200' from structure.

PLANT LIST COMMENT CODE

1. Not for use in coastal areas.
2. Should not be used on steep slopes.
3. May be damaged by frost.
4. Should be thinned bi-annually to remove dead or unwanted growth.
5. Good for erosion control.
6. Grows best in well drained soils.
7. Produces flowers or fruit that attracts birds and/or butterflies
8. Adaptability can vary.
9. Can be used as a lawn substitute.
10. Showy flowers.
11. Produces edible fruit.
12. Native or native cultivar.
13. Tends to be short lived.
14. High fire resistance.
15. Dead fronds or leaves need to be removed to maintain fire safety.
16. Tolerant of heavy pruning.
17. Must be cut back after flowering.
18. May require partial shade in desert or valley areas.
19. Perennial.
20. Tolerates saline soils.
21. Grows naturally in riparian areas.
22. Good tree for lawns.
23. Produces habitat or food for wildlife.
- X. May be invasive in some areas.

The desirable planting list is based on comments from numerous professionals and public agencies. These resources included the Sunset Western Garden Book, Bob Perry's Landscape Plants for Western Regions, and the California Department of Water Resources study entitled, WUCOLS (Water Use Classification of Landscape Species).

GROUNDCOVERS – REVISED 7/2011

Groundcovers in Zone A, especially woody species, should be maintained at a height of 6 inches or less in Zone A and flat areas of Zone B.

Groundcovers on slopes in Zone B within 50 feet of the structure shall be maintained at a height of 12 inches or less.

Groundcovers on slopes in Zone B outside of 50 feet from the structure should be maintained at a height of 18 inches or less.

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Abelia grandiflora 'Prostrata'	Prostrate Glossy Abelia	B	M	1 - 2'	3 - 4'	E	C,IV - 3
Acacia redolens 'desert carpet'	Desert Carpet Acacia	B-30	L	2'	10-15'	E	C,IV,D-3,5,6,10
A. r. 'Low Boy'	Low Boy Acacia	B-30	L	3'	10-15'	E	C,IV,D-3,5,6,10
Achillea tomentosa	Woolly Yarrow	A,B	L	6 - 10"	6 - 12"	E	C,IV - 7,9,19
Aeonium species	NCN	A,B	L	varies	varies	E	C,IV-2,3,8,14
Ajuga reptans	Carpet Bugle	A,B	H	4 - 6"	2 - 4"	E	C,IV - 2,18,19
Arctostaphylos edmundsii	Little Sur Manzanita	B-30	L,VL	1 - 2'+	4 - 6'	E	C,IV - 4,6,12
A. 'Emerald Carpet'	Emerald Carpet Manzanita	B	L,VL	1'	4 - 6'	E	C,IV - 4,6,12
A. hookeri 'Monterey Carpet'	Monterey Manzanita	B	L	1-2'	8-12'	E	C,IV-6,7,12,23
A. 'Pacific Mist'	NCN	B	L	1-2'	8-10'	E	C,IV-6,7,12,23
A. uva-ursi	Bearberry	B	L	6-12"+	10-15'	E	C,IV-5,6,7,12,23
Artemisia californica 'cultivars'	Sagebrush - Prostrate Forms	B-30	L,VL	varies	varies	E	C,IV,D - 4,6,8,12,23
A. caucasica	Silver Spreader	A,B	L,VL	3-6"	2'	E	C,IV,D-4,6,12
Baccharis pilularis 'Pigeon Point'	Dwarf Coyote Brush	B	L,VL	12-24"	-6'	E	C,IV,D-4,5,12
B.p. 'Twin Peaks'	Dwarf Coyote Brush	B	L,VL	12-24"	-6'	E	C,IV,D-4,5,12
Ceanothus gloriosus	Point Reyes Ceanothus	B	L	1-2'	12-16'	E	C-6,7,10,12
Cerastium tomentosum	Snow-In-Summer	A,B	M,L	6-8"	2-3'	E	C,IV,D-10,14,19
Chamaemelum nobile	Chamomile	A,B	M	6-8"	-12"	E	C,IV,D-9,16,19
Cistus salviifolius	Sageleaf Rockrose	B	L,VL	1-2'	6'	E	C,IV,D-4,5,6,7,10,16,20
C. 'Sunset'	Rockrose	B	L,VL	1-2'	6-8'	E	C,IV,D-4,5,6,7,10,16,20
C. 'Warley rose'	Rockrose	B	L,VL	1'	4'	E	C,IV,D-4,5,6,7,10,16,20
Coprosma kirkii	NCN	B	M,L	-2'	6-8'	E	C,IV-3,4,5,8,18,20
Coreopsis auriculata 'Nana'	NCN	A,B	L,VL	5-8"	-2'	E/D	C,IV-3,8,19
Cotoneaster adpressus praecox	Cotoneaster	B	M,L	-18"	-6'	D	C,IV,D-2
C. salicifolius 'Emerald Carpet'	Prostrate Willowleaf Contoneaster	B	M,L	12-15"	-8'	E	C,IV,D-4
Dalea greggii	Trailing Indigo Bush	B	L,VL	12-18"	5-10'	E	IV,D - 6
Delosperma alba	White Training Ice Plant	A,B	L	-12"	2'	E	C,IV-10
Dichondra micrantha	Dichondra	A,B	H,M	-6"	-2'	E	C,IV-9,14,18
Drosanthemum floribundum	Rosea Ice Plant	A,B	L	-12"	1'-2'	E	C,IV-3,5,10
Duchesnea indica	Indian Mock Strawberry	A,B	L	-8"	-4'	E	C,IV,D-11,16,19
Dymondia margaretae	NCN	A,B	M,L	-3"	12-24"	E	C,IV-3,8
Erigeron glaucus	Seaside Daisy	A,B	M,L	10-12"	-2'	E	C,IV-3,6,8,10,12,18,19,20
E. karvinskianus	Santa Barbara Daisy	B	M,L	10-20"	-3'	E	C,IV-3,6,8,10,12,18,19,20
Euonymus fortunei 'Colorata'	Purple-Leaf Winter Creeper	B	M	1-2'	-6'	E	IV-1,5,8,16
Festuca glauca (cinerea)	Blue Fescue	A,B	M,L	-12"	-2'	E	C,IV,D-4
F. rubra	Red Fescue	A,B	M,L	-16"	-30"	E	C,IV,D-4,9
Fragaria chiloensis	Wild Strawberry	A,B	L,VL	6-12"	-24"	E	C,IV,D-4,10,11,12,14,20
Gazania Hybrids	Trailing Gazania	A,B	M,L	6-10"	-24"	E	C,IV,D-10,19,X
Geranium incanum	Cranesbill	A,B	M,L	-12"	2'	E	C,IV-4,10,19,X
Glechoma hederacea	Ground Ivy	A,B	M	3-6"	-18"	E/D	C,IV,D-8,19
Helianthemum nummularium	Sunrose	A,B	M	6-8"	-3'	E	C,IV,D - 6,10
Herniaria glabra	Green Carpet	A,B	M	2-3"	16"	E	C,IV,D-6,8,9,19
Heuchera Species	Coral Bells	A,B	M,L	6"-2'	2'	E/D	C,IV,D-6,7,8,10,12,15,18,19
Hypericum calycinum	Aaron's Beard	B	M,L	6-12"	-3'	E	C,IV,D-4,5,7,16

GROUNDCOVERS – page 2

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
H. coris	St. Johnswort	B	M,L	6-12"	-2'	E	C,IV,D-4,5,7,16
Iberis sempervirens	Evergreen Candytuft	A,B	M	6-12"	-6-12"	E	C,IV,D-10,19
Iva hayesiana	Poverty Weed	B-30	L,VL	2-3'	4-5'	E	C,IV,D-4,5,12,16,23
Juniperus conferta & cultivars	Shore Juniper	B	L	1'	6-8'	E	C,IV,D-5,8,20
J. horizontalis & cultivars		B	L	1'	6-8'	E	C,IV,D-5,8,20
Laurentia fluvialis	Blue Star Creeper	A	M	2-4"	6-12"	E	C,IV-8,19
Lysimachia nummularia	Moneywort	A	H,M	2-6"	-2'	E	C,IV -18,19
Liriope spicata	Creeping Lily Turf	A,B	M	12"	3'	E	C,IV,D-14,18
Mahonia aquifolium 'Compacta'	Compact Oregon Grape	B	M,L	1-2'	2-3'	E	C,IV-4,7,12,18,23
M. repens	Creeping Mahonia	B	M,L	2-3'	2-3'	E	C,IV-4,7,12,18,23
Myoporum 'Pacifcum'	Pacific Myoporum	B	M,L	2-3'	-30'	E	C,IV-1,4,5,16
M. parvifolium	NCN	A,B	M,L	-6"	9'	E	C,IV-3,5,
M. p. 'Putah Creek'	NCN	B	M,L	1'	8'	E	C,IV-3,5,
Oenothera berlandieri	Mexican Evening Primrose	B	L,VL	10-12"	4'	E	IV,D-1,4,7,10,17,19
O. stubbei	Baja Evening Primrose	A,B	L,VL	5"	2'	E	IV,D-7,12,19
Ophiopogon japonicus	Mondo Grass	A,B	M	8-12"	12-24"	E	C,IV-14,18
Pelargonium peltatum	Ivy Geranium	A,B	M	-2'	-4'	E	IV - 1,3,7,10,19
P. tomentosum	Silver Spreader	A,B	M	-18"	2-4'	E	IV-1,3,7,10,19
Persicaria capitata	Pink Clover	A,B	M,L	-18"	3'	E	IV,D -1,10,19,X
Phyla nodiflora (Lippia repens)	Lippia	A,B	M,L	2-15"	-3'	E/D	C,IV,D-9,16,19
Potentilla tabernaemontani	Spring Cinquefoil	A,B	M,L	2-6"	-12"	E	C,IV,D-9,10,19
Ribes viburnifolium	Catalina Perfume	B	L,VL	-3'	-3'	E	C,IV - 12,18,23
Rosmarinus officinalis							
R.o. 'Huntington Carpet (Blue)'	NCN	B-30	L	-18"	-4'	E	C,IV,D - 4,5,16
R.o. 'Prostratus'	Prostrate Rosemary	B-30	L	-24"	-6'	E	C,IV,D - 4,5,16
Salvia sonomensis	Creeping Sage	B	L	8-12"	3-4'	E	C,IV-6,12,13,23
Scaevola 'Mauve Clusters'	NCN	A,B	M,L	4-6"	3-4'	E	C,IV - 6,18,19
Sedum species	Stonecrops	A,B	L,VL	varies	varies	E	C,IV - 2,8,14
Senecio mandraliscae	Chalksticks	A,B	M,L	-18"	-5'	E	C,IV - 3,14,19
S. serpens	Blue Chalksticks	A,B	M,L	-12"	-3'	E	C,IV-3,14,19
Soleirolia soleirolia	Baby's Tears	A	H,M	3-6"	-18"	E	C,IV - 3,14,18,19
Teucrium cossonii majoricum	NCN	A,B	L	8"	-2'	E	C,IV - 6,10
T. X lucidrys 'Prostratum'	Prostrate Germander	A,B	M,L	4-6"	-3'	E	C,IV,D - 4,16
Thymus praecox arcticus	Mother of Thyme	A,B	M,L	2-6"	-18"	E	C,IV,D - 8
T. pseudolanuginosus	Woolly Thyme	A,B	M,L	2-3"	-12"	E	C,IV,D - 8
Trachelospermum jasminoides	Star Jasmine	A,B	M,L	-2'	4-5'	E	C,IV,D - 5,7,10,16
Trifolium fragiferum	White Clover	A,B	M,L	6-15"	-6'	E	C,IV,D-5,9,16,19
Verbena X hybrida	Garden Verbena	A,B	L,VL	6-12"	1 1/2-3'	E	C,IV,D - 3,7,10,13
V. peruviana	NCN	A,B	L,VL	-8"	-2'	E	C,IV,D - 7, 10
V. pulchella gracilior	Moss Verbena	A,B	L,VL	12-15"	2-3'	E	C,IV,D-8,10,19
Vinca minor	Dwarf Periwinkle	A,B	M,L	12"	3'	E	IV,D - 1,5,16,18, X
Wedelia trilobata	Wedelia	B	M,L	1-2'	4-6'	E	C,IV- 3,16, 20
Zoysia tenuifolia	Korean Grass	A	M,L	-6"	-18"	E	C,IV,D - 9

SHRUBS - REVISED 7/2011

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Abelia grandiflora	Glossy Abelia	A,B-10	M	8'	8'	E	C,IV,D - 4, 10
A. g. 'Prostrata'	Prostrate Glossy Abelia	A,B-5	M	2'	4'	E/D	C,IV,D - 10
Abutilon hybridum	Flowering Maple, Chinese Lantern	A,B-10	M	10'	10'	E	C,IV - 4
Acanthus mollis	Bear's Breech	A,B	H,M	-4'	4-6'	E/D	C,IV,D-3,8,14,16,17,18,19
Achillea filipendulina	Fernleaf Yarrow	A,B	L,VL	4-5'	2'	E	C,IV,D - 10,16,17,19
A. millefolium	Common Yarrow	A,B	L,VL	-3'	2'	E	C,IV,D - 10,16,17,19
Aeonium species	NCN	A,B	L	varies	varies	E	C,IV - 3,8,14
Agapanthus species	Lily-Of-The-Nile	A,B	M	varies	varies	E/D	C,IV - 3,4,7,10,14,19
Agave species	Agave	A,B	L,VL	varies	varies	E	C,IV,D - 3,10,14,17
Alocasia macrorrhiza	Elephant's Ear	A,B	H	5'	8'	E/D	C,IV - 3,14,18,19
Aloe species	Aloe	A,B	L,VL	varies	varies	E	C,IV, - 3,7,8,14,15
Alyogyne huegelii	Blue Hibiscus	A,B-5	M,L	5-8'	6'	E	C,IV - 3,4,10
Anigozanthos flavidus	Kangaroo Paw	A,B	M,L	3-5'	3'	E	C,IV - 3,6,7,10,19
A. manqlesii	NCN	A,B	M,L	3'	-3'	E	C,IV - 3,6,7,19
Arbutus unedo 'Compacta'	Dwarf Strawberry Tree	A,B-5	M,L	6-8'	-8'	E	C,IV,D-5,7,11,18,23
A.u. 'Elfin King'	Elfin King	A,B-5	M,L	3-5'	-6'	E	C,IV,D - 5,7,11,18,23
A.u. 'Oktoberfest'	NCN	A,B-5	M,L	6-8'	-8'	E	C,IV,D-5,7,11,18,23
Arctostaphylos species	Manzanita	B	L,VL	varies	varies	E	C,IV,D - 4,6,7,10,12
Artemisia 'Powis Castle'	NCN	B	L,VL	-3'	6'	E	C,IV - 4,6,12,23
A. stelleriana	Beach Worm Wood	B	L,VL	-3'	-3'	E	C,IV - 4,6,12,19,23
Aspidistra elatior	Cast-Iron Plant	A,B	M,L	-30"	-3'	E	C,IV -3,18
Aucuba japonica	Japanese Aucuba, Gold Dust Plant	A,B-5	M,L	6-15'	6-15'	E	C,IV,D - 18
Baccharis species	Various	B	L,VL	varies	varies	E	C,IV,D-4,5,6,12,21,23
Begonia species	Begonia	A,B	H,M	varies	varies	E	C,IV - 3,8,10,14,18
Berberis thunbergii	Japanese Barberry	B	M,L	4-6'	4-6'	D	C,IV,D - 4
B. thunbergii 'cultivars'		A,B	M,L	varies	varies	D	C,IV,D - 4
Bergenia crassifolia	Winter Blooming Bergenia	A,B	M,L	-20"	-20"	E	C,IV - 3,18,19
Bougainvillea sp.	Bougainvillea	B	L	varies	varies	E/D	C,IV - 3,4,10
Buddleja davidii	Butterfly Bush	B	M,L	-10'	-12'	E/D	C,IV,D - 7,10,16,17,X
Buxus microphylla japonica	Japanese Boxwood	A,B-5	M,L	4-6'	4-6'	E	C,IV,D -16
B.m. koreana	Korean Boxwood	A,B-5	M,L	4-6'	4-6'	E	C,IV,D -16
Caesalpinia gilliesii	Bird of Paradise Bush	A,B	L,VL	-10'	-10'	E/D	C,IV,D - 7,10
C. mexicana	Mexican Bird of Paradise	A,B	L,VL	10-12'	-15'	E/D	C,IV,D - 7,10
C. pulcherrima	Red Bird of Paradise	A,B	L,VL	-10'	-10'	E/D	C,IV,D - 7,10
Calliandra californica	Baja Fairy Duster	B	L,VL	-8'	4-12'	E/D	C,IV,D -4,6,7,10,12
C. eriophylla	Fary Duster	B	L,VL	-3'	4-5'	E/D	C,IV,D -4,6,7,10,12
Callistemon citrinus'compacta'	Bottlebrush	B	L,VL	8'	8'	E	C,IV,D-5,7,10,20
C. viminalis "Little John"	NCN	A,B-10	L	5'	8	E	C,IV,D-5,7,10,20
Calycanthus occidentalis	Spice Bush	B	M,L	4-12'	-5'	D	C,IV-12,18
Carissa macrocarpa (grandiflora)	Natal Plum	A,B-10	M,L	7+	7+	E	C,IV - 4,11,16
C. m. 'cultivars'	Natal Plum	A,B-10	M,L	varies	varies	E	C,IV - 4,11,16
Carpenteria californica	Bush Anemone	A,B-10	L,VL	6-8'	6-8'	E	C,IV - 6,7,10,12
Cassia (Senna) artemisioides	Feathery Cassia	A,B-10	L,VL	3-6'	-6'	E	C,IV,D - 10,
Ceanothus species	Wild Lilac	B-30	L,VL	varies	varies	E/D	C,IV,D - 4,6,7,10,12,23
Cercocarpus betuloides	Mountain Mahogany	B-30	L,VL	5-12'	-10'	E	C,IV,D - 4,6,12,23
Choisya ternata	Mexican orange	B	M	6-8'	-8'	E	C,IV - 10,18

SHRUBS — page 2

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Cistus species	Rockrose	A,B-10	L,VL	varies	varies	E	CilV,D - 4,5,6,10,17,20,X
Clivia miniata	Clivia	A,B	H,M	2'	2'	E	C,IV - 3,10,14,18,19
Colocasia esculenta (caladium)	Taro, Elephant's Ear	A,B	H	-6'	-6'	E/D	C,IV - 3,14,18,19
Comarostaphylis diversifolia	Summer Holly	B	L,VL	6-10'+	6-8'+	E	C,IV,D-6,7,12,18,23
Convolvulus cneorum	Bush Morning Glory	B	L	2-4'	2-4'	E	C,IV,D-6,10
Coprosma petriei (pumila)	NCN	B	M	-3'	8'	E	IV - 1,4,16,20
C. repens	Mirror Plant	B	M	-10'	-6'	E	IV - 1,4,16,20
Cotoneaster species & cultivars	Cotoneaster	B	M,L	varies	varies	E/D	C,IV,D - 4,10,16,X
Cotyledon species	NCN	A,B	L	1-3'	1-3'	E	C,IV - 3,8,14
Crassula species	NCN	A,B	L	1-9'	1-9'	E	C,IV - 3,8,14,X
Cuphea hyssopifolia	False Heather	A,B	M	2'	3'	E	V,IV - 3,7,10,
Cycas revoluta	Sago Palm	A,B	M	8'	10'	E	C,IV,D - 3,8,15,18
Cyrtomium falcatum	Holly Fern	A,B	H,M	2-3'	3-4'	E	C,IV - 15
Dasyliion longissimum	Mexican Grass Tree	A,B-10	L,VL	-10'	8'	E	C,IV,D-15
D. wheeleri	Sotol	A,B-10	L,VL	-6'	-6'	E	C,IV,D-15
Dendromecon harfordii	Island Bush Poppy	B	L,VL	8-20'	10-20'	E	C,IV - 5,10,12,23
Dietes bicolor	Fortnight Lily, African Iris	A,B	M,L	2-3'	2-3'	E	C,IV,D - 4,10,15,19
Dietes iridioides	Fortnight Lily, African Iris	A,B	M,L	3'	3'	E	C,IV,D - 4,10,15,19
Dodonaea viscosa	Hopseed Bush	B	M,L	12-18'	10+	E	C,IV,D - 3,4
D. v. 'Purpurea'	Purple Hopseed Bush	B	M,L	12-18'	10+	E	C,IV,D - 3,4
Elaeagnus pungens & cultivars	Silverberry	B	M,L	6-15'	6-15'	E	C,IV,D - 16
Encelia californica	Coast Sunflower	A,B-10	L,VL	3-5'	3-5'	E/D	C,IV-5,6,10,4,17
E. farinosa	Brittle Bush	B	L,VL	3-5	3-5	E/D	C,IV,D - 4,5,6,10,12,17
Eriogonum giganteum	St. Catherine's Lace	B	L,VL	- 8'	- 8'	E	C,IV - 4,6,10,12,19,20
Escallonia species	Escallonia	A,B-5	M,L	2-15'	2-10'	E	C,IV - 4,10,16
Euonymus japonica & cultivars	Evergreen Euonymus	A,B	M	2-10'	-6'	E	C,IV,D - 4,16
Euphorbia species	Varies	A,B	M,L,VL	varies	varies	E/D	C,IV - 1(varies),3,6,8,10,14,18
Euryops pectinatus	NCN	A,B	M,L	6'	6'	E	C,IV,D - 3,4,6,7,10
Fatsia japonica	Japanese Aralia	A,B	M	5-12'	6-10'	E	C,IV - 15,18
Fouquieria splendens	Ocotillo	A,B	VL	8-25'	8-15'	E	IV,D - 6,10,12
Fremontodendron species & cultivars	Flannel Bush	B	L,VL	5-20'	-15'	E	C,IV,D - 4,6,10,12
Gardenia augusta (jasminoides)	Gardenia	A,B	H	3-6'	3-5'	E	C,IV - 10,18
Garra elliptica	Coast Silk tassel	B	M,L	4-8'	4-8'	E	C,IV,D - 4,5,7,10,12
Grevillea species & cultivars	Grevillea	B	L,VL	varies	varies	E	C,IV,D - 3,4,5,7,8,10
Grewia occidentalis	Lavender Starflower	A,B-10	M	6-10'	6-10'	E	C,IV,D - 4
Hakea suaveolens	Sweet Hakea	B	L	10-20'	-15'	E	C,IV - 4,8
Hebe species & cultivars	Hebe	A,B-10	M	3-6'	3-6'	E	C,IV - 4,5,7,10,16
Helictotrichon sempervirens	Blue Oat Grass	A,B-15	M	2-3'	2-3'	E/D	C,IV,D - 15,19
Hemerocallis hybrids	Daylily	A,B	M,L	1-6'	2-6'	E/D	C,IV,D - 7,10,17,19
Hesperaloe parviflora	Red Yucca	A,B	VL	3-4'	4-6'	E	IV,D - 6,7,15,19
Heuchera Species	Coral Bells	A,B	M,L	6"-2'	2'	E/D	C,IV,D-6,7,8,10,12,15,18,19
Hibiscus rosa - sinensis	Chinese Hibiscus	A,B-5	M	-15'	-12'	E	C,IV - 3,4,7,10,18
Ilex species	Holly	B	M	varies	varies	E	C,IV,D - 7,16,X
Iris species & varieties/cultivars	Bearded Iris	A,B	M	-30"	-2'	E	C,IV,D - 10,19,X
I. douglasiana	Douglas Iris	A,B	M,L	-2'	-2'	E	C,IV - 10,12,18,19
Juniperus species	Juniper	B	M,L,VL	varies	varies	E	C,IV,D - 4, 7, 23

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BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Justicia brandegeana	Shrimp Plant	A,B	M	-3'	-4'	E	C,IV,D - 4,7,10
J. californica	Chuparosa	B	L,VL	2-5'	-4'	D	IV,D - 4,6,7,10,12
Keckiella cordifolia	Heart-Leaved Penstemon	B	L,VL	5-6'	8-10'	E/D	C,IV-4,7,12
Kniphofia uvaria	Red-Hot Poker	A,B	L	2-3'	3-4'	E	C,IV,D-3,7,10,19,X
Lantana Camara & hybrids	Lantana	A,B-10	M	varies	varies	E	C,IV,D - 4,7,10,X
Larrea tridentata	Creosote Bush	B	VL	4-8'	4-8'	E	IV,D-6,12,23
Lavandula angustifolia	English Lavender	A,B-10	L	3-4'	3-4'	E	C,IV,D-4,6,7,10,17
L. dentata	French Lavender	A,B-10	L	3'	3'	E	C,IV,D-4,6,7,10,17
L. intermedia	Lavandin	A,B	L	1-2'	2-3'	E	C,V,D-4,6,7,10,17
L. stoechas	Spanish Lavender	A,B-10	L	2-3'	3'	E	C,IV,D-4,6,7,10,17
Lavatera assurgentiflora	California Tree Mallow	B	L,VL	8-12'	8-12'	E	C,IV- 4,5,6,7,12,16,20
L. maritima	Tree Mallow	A,B-10	M,L	8-12'	8-12'	E	C,IV- 4,7,8,10,18
Leonotis leonurus	Lion's Tail	A,B-10	L	3-6'	4-6'	E	C,IV,D-3,7,10,17
Leptospermum scoparium & varieties	New Zealand Tea Tree	A,B-15	L,VL	10+	10+	E	C,IV-5,10,16
L. s. varieties	NCN	Varies	M-VL	varies	varies	E	C,IV-5,10,16
Leucophyllum candidum	Violet Silverleaf	A,B-10	L,VL	4-5'	4-5'	E	IV,D-4,6,7,10
L. frutescens	Texas Ranger	B	L,VL	6-8'	6-8'	E	IV,D-4,6,7,10
L. laevigatum	Chihuahuan Sage	A,B-5	L,VL	3-4'	4-5'	E	IV,D-4,6,7,10
Ligustrum japonicum	Wax-leaf Privet	A,B-10	M,L	10-12'	10	E	C,IV,D-7,10,15,X
Liriodendron muscari	Big Blue Lily Turf	A,B	M	18"	2-3'	E	C,IV,D-14,18
Lobelia laxiflora	Mexican Bush Lobelia	A,B-5	M,L	2-3'	4-6'	E	C,IV,D-4,7,10,19,X
Lupinus species	Lupine	B	L,VL	varies	varies	E/D	C,IV,D-4,6,7,10,12,17
Mahonia aquifolium	Oregon Grape	A,B-10	M,L	6-8'	6-8'	E	IV,D-4,6,11,12,18,23
Mahonia a. 'Compacta'	Compact Oregon Grape	A,B	M,L	1-2'	2-3'	E	C,IV-4,7,12,18,23
M. fremontii	Desert Mahonia	B	L	3-12'	4-8'	E	C,IV,D-4,6,10,11,12,23
M. 'Golden Abundance'	NCN	A,B-5	M,L	5-6'	6'	E	IV,D-4,6,10,11,12,18,23
M. lomariifolia	Venetian Blind Mahonia	A,B	M,L	6-10'	6-10'	E	C,IV,D-4,6,7,11,15,18,23
M. nevinii	Nevin Mahonia	B-30	L	3-10'	6-12'	E	C,IV,D-4,6,10,11,12,23
M. pinnata	California Holly Grape	B	M,L	4-5'	4-6'	E	C,IV-4,6,7,10,11,12,18,23
M. repens	Creeping Mahonia	A,B	M,L	2-3'	2-3'	E	C,IV-4,7,12,18,23
Malosma - See Rhus							
Malva species	Mallow	A,B	L	varies	varies	E/D	C,IV,D-6,7,10,13
Melaleuca nesophila	Pink Melaleuca	A,B-10	L,VL	10-20'	10-20	E	C,IV - 4,5,7,10,16
Mimulus species (Diplacus)	Monkey Flower	B	L	1-4'	1-4'	E	C,IV,D-4,6,7,10,12
Muhlenbergia rigens	Deer Grass	A,B-10	L,VL	4'	4'	D	C,IV,D- 12,15,17,19
Myrica californica	Pacific Wax Myrtle	B	M,L	10-15'+	10-15'+	E	C,IV - 4,5,7,12,20,23
Myrsine africana	African Boxwood	A,B-5	M	3-8'	3-8'	E	C,IV,D - 16,18
Myrtus communis 'compacta'	Dwarf Myrtle	A,B-10	M	5-8'	5-8'	E	C,IV,D-16
Nandina domestica	Heavenly Bamboo	A,B	M	6-8'	4-5'	E	C,IV,D-4,15
N.d. 'Compacta'	NCN	A,B	M	4-5'	3-4'	E	C,IV,D-4,15
N. d. 'Harbour Dwarf'	Dwarf Heavenly Bamboo	A,B	M,L	1 1/2 -2'	2-3'	E	C,IV,D-15
Nerium oleander	Oleander	B	M,L	8-20'	10-20'	E	C,IV,D-10,16,X
N.o. 'Petite Salmon'	NCN	A,B-10	M	3-4'	5-7'	E	C,IV-3,10,16
Opuntia species	Prickly Pear, Cholla etc.	A,B	L,VL	varies	varies	E	C,IV,D-8,12,14,23
Pelargonium species	Geranium	A,B	M,L	varies	varies	E	C,IV-3,10,19,X
Penstemon species	Beard Tongue	A,B	L	varies	varies	E/D	C,IV,D-7,10,12,17,19

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BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Phlomis fruticosa	Jerusalem Sage	A,B	M,L	3-4'	3-5'	E	C,IV,D-6,7,10,17,19
Phoenix roebelenii	Pygmy Date Palm	A,B	M,L	6-10'	6-10'	E	C,IV - 3,15,18
Phormium tenax	New Zealand Flax	A,B	M	5-9'	6'	E	C,IV,D-4,15,19
P.t 'cultivars'	NCN	A,B	M	varies	varies	E	C,IV,D-4,15,19
Photinia fraseri	Photinia	B	M,L	10-15'	10-20'	E	C,IV,D-4,7,10,16
Pittosporum tobira	Tobira	A,B-10	M,L	6-15'+	8-15'	E	C,IV,D-5,16
P.t.'Variegata'	NCN	A,B-5	M	5-8'	6-8'	E	C,IV,D-5,16
P.t.'Wheeler's Dwarf'	Dwarf Pittosporum	A,B	M	1-3'	2-4'	E	C,IV,D-16
Portulacaria afra	Elephant's Food	A,B	L	5-12'	6-12'	E	C,IV-3,14
Punica granatum 'Nana'	Dwarf Pomegranate	A,B	L	3'	4'	D	C,IV,D-7,11,20
Pyracantha species	Firethorn	B	M	varies	varies	E/D	C,IV,D-4,16,X
Rhamnus californica	Coffeeberry	B	M,L	3-15'	4-15'	E/D	C,IV,D-12,21,23
R. crocea	Redberry	B	M,L	2-3'	3'	E	IV-5,12,23
R.c. ilicifolia	Hollyleaf Redberry	B	M,L	3-15'	3-15'	E	IV-5,12,23
Rhaphiolepis indica	India Hawthorn	A,B-5	M,L	4-8'	4-8'	E	C,IV,D-4,5,10
R.i 'cultivars'	NCN	A,B	M,L	varies	varies	E	C,IV,D-5,10
Rhus integrifolia	Lemonade Berry	B-40	L	3-10'+	6-20'	E	C,IV-4,5,12,23
R.(Mollosma) laurina	Laurel Sumac	B-40	L	6-15'+	6-15'	E	C,IV-4,5,12,23
R. ovata	Sugar Bush	B-30	L	3-15'	6-15'	E	C,IV,D-4,5,12,23
Ribes aureum	Golden Currant	A,B-5	L	3-6'	3-6'	D	C,IV,D-7,10,12,23
R. malvaceum	Chaparral Currant	A,B-5	L	6-8'	6-8"	D	IV-7,10,12,23
R. sanguineum & cultivars	Red Flowering Currant	A,B-5	M,L	4-12'	4-8'	D	C,IV,D-7,10,12,23
R. speciosum	Fuchsia-Flowering Gooseberry	A,B-10	L	3-6'	3-6'	D	C,IV,D-4,7,10,12,23
R. viburnifolium	Catalina Perfume	A,B-10	L	3'	12'	E	C,IV-7,10,12,23
Romneya coulteri	Matilija Poppy	B	L	-8'	4'	D	C,IV,D-5,6,10,12,17
Rosa species	Rose	A,B	M	varies	varies	E/D	C,IV,D-10,16,17
Rosmarinus officinalis & cultivars	Rosemary	B	M,L	varies	varies	E	C,IV,D- 4, 5, 7
Salvia species - native varieties	Sage	B	L,VL	varies	varies	E/D	C,IV,D-4,7,10,12,17,23
Salvia species - ornamental varieties	Sage	A,B	M,L	varies	varies	E/D	C,IV,D-4,7,10,17,23
S. greggii	Autumn Sage	A,B	M,L	3-4'	3-4'	E	C,IV,D - 4,7,10
S. leucantha	Mexican Bush Sage	A,B	L,VL	3-4'	4-6'	E	C,IV- 7, 10,17
Santolina chamaecyparissus	Lavender Cotton	A,B	L	-24"	-3'	E	C,IV,D - 10
S. rosmarinifolia (virens)	Green Lavender Cotton	A,B	L	-24"	-3'	E	C,IV,D - 10
Simmondsia chinensis	Joboba	B	L,VL	3-8'+	4-8'	E	C,IV,D-4,6,11,23
Strelitzia nicolai	Giant Bird of Paradise	A,B	M	-30'	-20'	E	C,IV-3,4,10,15,18
S. reginea	Bird of Paradise	A,B	M	5'	4'	E	C,IV-3,4,10,15,18
Tibouchina urvilleana	Princess Flower	A,B-10	M	5-18'	5-10'	E	C,IV -3,4, 6,10
Trichostema lanatum	Woolly Blue Curls	B	L,VL	3-5'	5'	E	C,IV,D-6,7,10,12,17
Tulbaghia violacea	Society Garlic	A,B	M	18'	2'	E/D	C,IV,D-3,10,19
Viburnum species	Viburnum	A,B-10	M	varies	varies	E/D	C,IV,D-3,7,10
Westringia fruticosa	Coast Rosemary	A,B-10	M,L	5-7'	6-12'	E	C,IV,D-4,6,18
Xylosma congestum	Shiny Xylosma	A,B-10	M,L	15'+	15'+	E	C,IV,D-5,16,18
X.c. 'Compacta'	Compact Xylosma	A,B-5	M,L	8-12'	8-12'	E	C,IV,D-5,16,18
Yucca species	Yucca	B	L,VL	varies	varies	E	C,IV,D - 6,10,15
Zantedeschia aethiopica	Calla Lilly	A,B	H,M	2-4'	3'	E/D	C,IV,D - 3,10,14,18,X
Zauschneria californica	California Fuchsia	B	L,VL	1-3'	3-5'	E/D	C,IVD-4,5,7,10,12,13,23

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BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-COMMENTS
Acacia farnesiana	Sweet Acacia	A,B-15	L	15-20'	15-20'	D	IV,D-10,X
A. greggii	Catclaw Acacia	B	L,VL	15-25'	15-25'	E	IV,D-10,12,21,23
A. salicina	Willow Acacia	A,B-15	L	15-35'	12-25'	E	C,IV,D-10,X
A. smallii	NCN	A,B-15	L,VL	15-20'	15-20'	D	C,IV,D-10,12,21,23
A. stenophylla	Shoestring Acacia	A,B-15	M,L	20-45'	10-20'	E	C,IV,D-10,22,X
Acer macrophyllum	Bigleaf Maple	B	M	30-95'	30-95'	D	C,IV-12,21,23
A. negundo	Box Elder	B	M,L	-60'	-50'	D	C,IV,D-12,23
A. palmatum	Japanese Maple	A,B	M	-20'+	-20'	D	C,IV-6
A. saccharinum	Silver Maple	B-30	M	40-100'	40-100'	D	C,IV,D-22
Aesculus californica	California Buckeye	B	M,L	20+	30'	D	C,IV,D-6,7,10,12,23
Agonis flexuosa	Peppermint Tree	B	M,L	25-35'	25-35'	E	C,IV-3,22
Albizia julibrissin	Silk Tree	B	M	-40'	40'+	D	C,IV,D-7,10,22,X
Alnus cordata	Italian Alder	B	M	40'	25'	D	C,IV,D-22
A. rhombifolia	White Alder	B	H,M	50-90'	40'	D	IV-12,21,23
Arbutus 'Marina'	NCN	A,B-15	M,L	-40'	-40'	E	C,IV,D-5,7,10,11,23
A. unedo	Strawberry Tree	A,B-10	M,L	12-35'	20-35'	E	C,IV,D-5,7,10,11,23
Archontophoenix cunninghamiana	King Palm	A,B	M	50'	10-15'	E	C,IV-3,10,15
Bauhinia variegata	Purple Orchid Tree	B	M	20-35'	35'	E/D	C,IV-4,10
Betula pendula	European White Birch	A,B-10	M	30-40'	30'	D	C,IV,D-6,22
Brachychiton acerifolius	Flame Tree	B	L	60'	45-50'	D	C,IV,D-10,22
B. populneus	Kurrajong Bottle Tree	B	L	30-50'	30'	E	C,IV,D-10,22
Brahea armata	Blue Hesper Palm	A,B-10	L,VL	40'	10'	E	C,IV,D-6,10,15
B. edulis	Guadalupe Palm	A,B	L,VL	30'	10'	E	C,IV,D-6,15
Butia capitata	Pindo Palm	A,B-10	M,L	10-20'	10-15'	E	C,IV,D-10,11,15
Callistemon citrinus	Lemon Bottlebrush	B	M,L	-25'	-15'	E	C,IV,D-4,7,10
C. viminalis	Weeping Bottlebrush	A,B-10	M,L	20-30'	-15'	E	C,IV-4,7,10,X
Calocedrus decurrens	Incense Cedar	B	L,VL	75+	30+	E	IV,D-6,12
Calodendrum capense	Cape Chestnut	B	M	30'	25-40'	D	C,IV-7,10
Carya illinoensis	Pecan	B	M,L	70'	70'	D	C,IV,D-6,11
Cedrus deodara	Deodar Cedar	B-30	M,L	60-80'	40+	E	C,IV,D-6
Ceratonia siliqua	Carob	B-30	M,L	30-40'	40+	E	C,IV,D-6
Cercidium floridum	Blue Palo Verde	A,B	L,VL	30'	30'	D	IV,D-6,10,12,21,23
C. microphyllum	Littleleaf Palo Verde	A,B	L,VL	25'	25'	D	IV,D-6,7,10,12,21,23
Cercis occidentalis	Western Redbud	A,B-10	M,L	20'	20'	D	C,IV,D-7,10,12,23
Chamaerops humilis	Mediterranean Fan Palm	A,B	M	20'	20'	E	C,IV,D-15
Chilopsis linearis	Desert Willow	A,B-15	L	-35'	-35'	D	IV,D-6,7,10,12,23
Chionanthus retusus	Chinese Fringe Tree	A,B	M	20'	20'	D	C,IV-10
Chitalpa X tashkentensis	Chitalpa	A,B	M,L	20-30'	20-30'	D	C,IV,D-7,10,12
Chorisia speciosa	Floss Silk Tree	B	M	30-60'	30-40'	D	C,IV,D-10,22
Cinnamomum camphora	Camphor Tree	B-30	M,L	50'+	60'+	E	C,IV,D-22
Citrus species	Citrus	A,B	M	varies	varies	E	C,IV,D-3,6,10,11
Cocculus laurifolius	Laurel Leaf Snail Seed	B	M	25'	30'+	E	C,IV,D-4
Cordyline australis	Giant Dracaena	A,B	M	30'	15'	E	C,IV,D-15,X
Cupressus macrocarpa	Monterey Cypress	B-30	M	40'+	40'	E	C-6,12,23,X
Cyathea cooperi	Australian Tree Fern	A,B	M	20'	12'	E	C,IV-3,15,18
Dicksonia antarctica	Tazmanian Tree Fern	A,B	M	15'	12'	E	C,IV-15,18
Dracaena draco	Dragon Tree	A,B	M,L	20'	20'	E	C,IV-3,10,14,15
Eriobotrya deflexa	Bronze Loquat	A,B-10	M,L	20'	20'	E	C,IV,D-10
Erythrina species	Coral Tree	B	M,L	varies	varies	D	C,IV,D-3,7,8
Eucalyptus citriodora	Lemon-scented Gum	B	M,L	75-100'	-40'	E	C,IV,D-1,7,22

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BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-
<i>E. maculata</i>	Spotted Gum	B-30	M,L	60-80'	-40'	E	C,IV,D-1,7,22
<i>E. nicholii</i>	Willow Peppermint	B-30	M,L	-40'	-30'	E	C,IV,D-1,7,22
<i>E. sideroxylon</i>	Red Ironbark	B	M'L	35-80'	-35'	E	C,IV,D-1,7,10
<i>E. torquata</i>	Coral Gum	A,B-15	M,L	-25'	-20'	E	C,IV,D-1,6,7,10,20
<i>Feijoa sellowiana</i>	Pineapple Guava	A,B	M,L	18-25'	-25'	E	C,IV,D-3,7,8,10,11,16
<i>Ficus species</i>	Fig	B-	M,L	varies	varies	E,D	C,IV,D-3,*
<i>Fraxinus augustifolia</i>	Raywood Ash	B	M	25+35'	30'	D	C,IV,D-22
<i>F. dipetala</i>	Foothill Ash	B	L,VL	18-20'	20-30'	D	C,IV,D-12,21,22,23
<i>F. latifolia</i>	Oregon Ash	B	M	40-80'	40-60'	D	C,IV,D-12,22,23
<i>F. velutina</i>	Arizona Ash	B	M,L	20-50'	30-50'	D	C,IV,D-22,23
<i>F.v. Coriacea</i>	Montebello Ash	B	M,L	20-40'	20-40'	D	C,IV,D-12,22,23
<i>Geijera parviflora</i>	Australian Willow	A,B-15	M,L	25-30'	20-30'	E	C,IV,D-6
<i>Ginkgo biloba</i>	Maidenhair Tree	A,B-15	M,L	35-80'	30-60'	D	C,IV,D-6,22
<i>Gleditsia triacanthos</i>	Honey Locust	A,B-15	M,L	35-70'	-30'	D	C,IV,D-6,22,X
<i>Grevillea robusta</i>	Silk Oak	B	M	60'+	30'+	E	C,IV,D-3,7,10
<i>Heteromeles arbutifolia</i>	Toyon	A,B-15	L,VL	15-30'	15-30'	E	C,IV,D-5,7,10,12,23
<i>Hymenosporum flavum</i>	Sweetshade Tree	A,B	M,L	20-40'	15-20'	E	C,IV-10
<i>Jacaranda mimosifolia</i>	Jacaranda	B	M,L	25-40'	-30'	D	C,IV,D-10,22
<i>Juglans californica</i>	Southern California Black Walnut	B	L	20-35'	30-45'	D	C,IV,-5,6,12,23
<i>Koelreuteria bipinnata</i>	Chinese Flame Tree	B	M	20-40'	-45'	D	C,IV,D-6,22
<i>K. paniculata</i>	Golden Rain Tree	B	M,L	20-35'	-40'	D	C,IV,D-20,22,X
<i>Lagerstroemia indica</i>	Crape Myrtle	A,B	M,L	-30	-20	D	IV,D-10,22
<i>Laurus nobilis</i>	Sweet Bay	B	M	20-40'	20-40	E	C,IV-3,16
<i>Leptospermum laevigatum</i>	Australian Tea Tree	A,B-15	L,VL	10-30	10-30'	E	C,IV-5,10,16
<i>Liquidambar formosana</i>	Chinese Sweet Gum	A,B-15	M	40-60'	25'	D	C,IV,D-7
<i>L. styraciflua</i>	American Sweet Gum	A,B-15	M	60'	-25'	D	C,IV,D-7
<i>Liriodendron tulipifera</i>	Tulip Tree	B	M	60-80'	40'	D	C,IV,D-22
<i>Lithocarpus densiflorus</i>	Tanbark Oak	B	L	-60'	-40'	E	C,IV-6,12,23
<i>Lophostemon(Tristania) confertus</i>	Brisbane Box	A,B-15	L,VL	30-60'	-40'	E	C,IV-22
<i>Lyonothamnus floribundus</i>	Catalina Ironwood	A,B-15	M	20-35	15'	E	C,IV-6,10,12,15,23
<i>Magnolia grandiflora</i>	Southern Magnolia	B	M	60-80'	40-60'	E	C,IV,D-10,22
<i>M. X soulangeana</i>	Saucer Magnolia	A,B	M	15-25'	25'+	D	C,IV,D-10
<i>Maytenus boaria</i>	Mayten Tree	A,B-10	M,L	30-50'	30'	E	C,IV-6,22,X
<i>Melaleuca quinquenervia</i>	Cajeput Tree	A,B-15	M,L	20-40'	15-25'	E	C,IV,D-10
<i>Metasequoia glyptostroboides</i>	Dawn Redwood	A,B-15	H,M	-80'	-40'	D	C,IV-22
<i>Metrosideros excelsa</i>	New Zealand Christmas Tree	A,B-10	L,VL	-30'	-30'	E	C,IV-5,6,7,10
<i>Morus alba</i>	White Mulberry	B	M,L	20-60'	30-50'	D	C,IV,D-11,16
<i>Olea europaea</i>	Olive - Fruitless varieties only	A,B-15	L,VI	-35'	20-30'	E	C,IV,D-11,16,20,X
<i>Parkinsonia aculeata</i>	Jerusalem Thorn	A,B-10	L,VL	15-30'	15-30'	D	C,IV,D-3,6,7,10,22,X
<i>Phoenix dactylifera</i>	Date Palm	B	M,L	80'	30'	E	C,IV,D-7,11,15,X
<i>Pinus species</i>	Pine	B-75	L,VL	varies	varies	E	C,IV,D-15,23
<i>Pistacia chinensis</i>	Chinese Pistache	B	M,L	-60'	-50'	D	C,IV,D-22,X
<i>Pittosporum phillyreoides</i>	Willow Pittosporum	A,B	L	15-25'	10-15'	E	C,IV,D-10
<i>P. rhombifolium</i>	Queensland Pittosporum	A,B	M	15-35'	-25'	E	C,IV,D-22
<i>Platanus racemosa</i>	California Sycamore	B	L	50-100'	50-100'	D	C,IV,D-12,21,22,23
<i>Podocarpus gracilior</i>	Fern Pine	B	M	-60'	-60'	E	C,IV,D-16,22
<i>P. macrophyllus</i>	Yew Pine	B	M	-50'	-45'	E	C,IV,D-16,22
<i>Populus fremontii</i>	Fremont Cottonwood	B	M	40-60'	40-60'	D	C,IV,V-12,21,22,23
<i>Prosopis chilensis</i>	Chilean Mesquite	B	L	30-50'	30-50'	E/D	C,IV,D-10,23
<i>P. glandulosa</i>	Honey Mesquite	A,B-15	L,VL	25-30'	25-30'	D	C,IV,D-5,7,21,22,23

TREES – page 3

BOTANICAL NAME	COMMON NAME	ZONE	WATER NEEDS	HEIGHT	SPREAD	E/D	GEOGRAPHICAL AREA-
<i>Prunus cerasifera</i> 'Atropurpurea'	Purple-leaf Plum	A,B-10	M,L	25'	25'	D	C,IV,D-10,11,22
<i>P. ilicifolia</i>	Hollyleaf Cherry	A,B-15	L,VL	15-30'	15-30'	E	C,IV,D-7,11,12,16,23
<i>Punica granatum</i>	Pomegranate	A,B-10	L	12-18'	-20'	D	C,IV,D-7,11,20
<i>Pyrus calleryana</i> & cultivars	Ornamental Pear	A,B-15	M	varies	varies	D	C,IV,D-10
<i>P. Kawakamii</i>	Evergreen Pear	A,B-10	M	15-30'	15-30'	E/D	C,IV,D-10
<i>Quercus agrifolia</i>	Coast Live Oak	B-30	L,VL	30-70'	70'+	E	C,IV,D-6,12,23
<i>Q. chrysolepis</i>	Canyon Live Oak	B-30	M,L	30-60'	20-60'	E	C,IV-6,12,36
<i>Q. douglasii</i>	Blue Oak	B-30	M	50'	50+	D	C,IV,D-6,12,23
<i>Q. engelmannii</i>	Engelmann Oak	B-30	I	60'	60+	E	IV,D-6,12,33,23
<i>Q. ilex</i>	Holly Oak	B-30	M	40-70'	40-70'	E	C,IV,D-6,23
<i>Q. kelloggii</i>	California Black Oak	B	M	30-80'	-60'	D	IV-6,12,23
<i>Q. lobata</i>	Valley Oak	B-30	L,VL	70'+	70'+	D	C,IV-6,12,23
<i>Q. palustris</i>	Pin Oak	B-30	M	50-80'	5-70'	D	C,IV,D-6,22,23
<i>Q. rubra</i>	Red Oak	B-30	M	60-75'	50'	D	C,IV,D-6,23
<i>Q. suber</i>	Cork Oak	B-30	M	70-100'	-100'	E	C,IV,D-6,23
<i>Q. virginiana</i>	Southern Live Oak	B-30	M,L	60'	100'	E/D	C,IV,D-22
<i>Q. wislizenii</i>	Interior Live Oak	B	M,L	30-75'	75'+	E	IV,D-6,12,23
<i>Rhus lancea</i>	African Sumac	A,B-15	L	20-30'	20-30'	E	C,IV,D-20,22
<i>Robinia ambigua</i>	Locust	B	M,L	30-50'	-30'	D	IV,D-1,7,10,22
<i>Sapium sebiferum</i>	Chinese Tallow Tree	B	M	-35'	-35'	D	IV,D-22,X
<i>Schefflera actinophylla</i>	Queensland Umbrella Tree	A,B	H,M	20'+	20'+	E	C-3,8,18
<i>S. pueckleri</i>	Tupidanthus	A,B	H,M	20'+	20'+	E	C-3,8,18
<i>Sophora japonica</i>	Japanese Pagoda Tree	B	M	30-50'	30-50'	D	C,IV,D-22
<i>Stenocarpus sinuatus</i>	Firewheel Tree	A,B-10	M	30'	15'+	E	C,IV-6,10,22
<i>Syagrus romanzoffianum</i>	Queen Palm	A,B	M	50'	-20'	E	C,IV-15
<i>Tabebuia chrysotricha</i>	Golden Trumpet Tree	A,B-15	M	25-30'	-30'	E	C,IV-6,10,22
<i>T. impetiginosa</i>	Pink Trumpet Tree	A,B-15	M	35'	-30'	E	C,IV-6,10,22
<i>Taxodium mucronatum</i>	Montezuma Cypress	B	H-L	75'	35'	E/D	C,IV-22
<i>Tipuana tipu</i>	Tipu Tree	B	M	-50'	-50'	D	C,IV-10,22
<i>Trachycarpus fortunei</i>	Windmill Palm	A,B	M	-30'	-6'	E	C,IV,D-15
<i>Umbellularia californica</i>	California Bay	B	L,VL	30-75'	30-75'	E	C,IV,D-5,12,23
<i>Washingtonia filifera</i>	California Fan Palm	B-30	M-VL	60'	20'	E	C,IV,D-3,7,10,12,15,21,X
<i>Zelkova serrata</i>	Sawleaf Zelkova	B	M	60'	60'	D	C,IV,D-22
<i>Ziziphus jujuba</i>	Chinese Jujube	A,B-15	M,L	20-30'	20-30'	D	C,IV,D-11,20,22

APPENDIX V

WHERE TO GET HELP AND FIND MORE INFORMATION

CAL FIRE

Wildfire Fire Hazard Severity Zones and maps of recommended Zones in local responsibility areas, including Los Angeles County:

http://www.fire.ca.gov/fire_prevention/fire_prevention_wildland.php

Defensible Space Guidelines

http://www.fire.ca.gov/cdfbofdb/PDFS/4291finalguidelines2_23_06.pdf

Los Angeles County

Creating defensible space in the Santa Monica Mountains

<http://www.fire.lacounty.gov/Forestry/RoadMaptoFireSafety.pdf>

LA County "Green Building Program"

<http://planning.lacounty.gov/green>

University Publications

Creating Sustainable Fire-safe Landscapes

<http://celosangeles.ucdavis.edu/files/63878.pdf>

Fire-safe and Firewise Issues:

<http://forestry.berkeley.edu/fireabate/fireuc.html>

Fire Safety in the "Wildland Urban Interface"

<http://groups.ucanr.org/SAFE/>

Homeowners Mitigation Guide

<http://groups.ucanr.org/HWMG/>

APPENDIX VI

FUEL MODIFICATION PLAN CHECKLIST

County of Los Angeles Fire Department

Fuel Modification Unit

605 N. Angeleno Avenue

Azusa, CA 91702-2904

(626) 969-5205 Fax (626) 969-4848

☐ **1. PRELIMINARY SUBMITTAL REQUIREMENTS**

SUBMIT THREE (3) SETS OF SITE PLANS: Include a vicinity map, the Assessor's Parcel Number, the legal description, building envelopes, topography, and proposed fuel modification zone delineation (optional). Include the complete contact information and project address. **Include square footage of new building or addition (include covered patios or porches).** The scale and size of paper used in the plan should be appropriate to the size of the project and large enough to show details. Use a recognized scale or appropriate graphic scale. Unless size is prohibitive, folded sets of plans are preferred.

Indicate on the site plan the existing land uses in all directions up to 200 feet from structures: existing homes or structures, projects under construction, natural/existing vegetation, roads, parks, and anything which may be significant in assessing wildland fire threats. Existing vegetation should be identified to species, drawn to scale, and show actual canopy.

PROVIDE COLOR PHOTOGRAPHS, (2 sets) with a photo orientation map, which adequately show where structures will be located, and the type, size, location, and density of existing vegetation.

Projects are required to pay a Plan Check Fee. These fees will be required to be paid prior to the release. Include contact information for whomever will pay applicable fees. Information should include the name, address, phone number, and fax number for the responsible party.

☐ **2. FINAL SUBMITTAL REQUIREMENTS (Include all items above)**

SUBMIT THREE (3) SETS OF LANDSCAPE PLANS: Include the location, species and size (to scale) of all existing native and ornamental plants to remain on site. Indicate trees, shrubs, groundcovers and areas of brush to remain or be removed following fuel modification. Existing vegetation should be identified to species, drawn to scale, and show actual canopy unless scheduled for removal.

Indicate proposed landscaping including the location, species, size and spacing of plants (show plants at 75% or greater of expected mature size). In lieu of showing specific planting locations, landscape plans may include a plant pallet (for plants of similar size and characteristics) for each fuel modification zone which also indicates minimum spacing. Tree and large shrub placement should be identified. Please refer to the "*Fuel Modification Plant Reference*" for spacing guidelines. Include site assessment notes and signed maintenance agreement on the plan.

The landscape plan may be combined with the site plan but should be clearly legible. Plans that are not legible will be returned unchecked for resubmittal. The plan should include a plant legend identifying common and scientific names. It should also include any specific design specifications and maintenance intended for the site such as pruning, hedge or groundcover heights, seasonal mowing etc.

SUBMIT AT LEAST ONE (1) SET OF IRRIGATION PLANS Indicate areas to be irrigated, valve and head locations. Indicate whether the irrigation systems will be manual or automated. The landscape in Zones A and B must receive adequate moisture to maintain plant health and live-moisture content.

☐ **3. SUBMIT COPIES OF DOCUMENTS WHICH MAY DISCLOSE CONFLICT WITH FUEL MODIFICATION PLAN REQUIREMENTS, IF APPLICABLE** (California Coastal Commission constraints, California Fish and Game Streambed Alteration Agreements, Ecologically Sensitive Habitat Areas (ESHAs), Environmental Review Board recommendations, oak tree preservation, endangered species habitat mitigation, etc).

NOTE: Approval of a Fuel modification Plan does not eliminate the requirement to obtain appropriate environmental, grading, zoning, permissions, permits or other requirements from agencies having jurisdiction.

"Fuel Modification Plan Guidelines" may be found at <http://www.lacofd.org/forestry.htm> If you would like additional information or have any questions please call the Fuel modification Unit.

APPENDIX VII

APPLICATION INFORMATION

Please include this sheet with your submittal. The processing of your plan will be delayed if the information is not complete.

Applicant/Contact Information:

Name(s): _____

Address: _____

Phone: _____

Site Information:

Project FEBP/RTM/FLTM : _____

Project FEPC: _____

Project Name/Description: _____

Owner(s): _____

Site Address: _____

Parcel/APN: _____

Structure Size: Include square footages of any attached garages and patios in the total for each structure. For additions, include the current and proposed square footage.

Structure Type: Single Family Home, Garage, Barn, Guest House, Gazebo, Retail, etc.

Structure #1 _____ sq ft Type: _____.

Structure #2 _____ sq ft Type: _____.

Structure #3 _____ sq ft Type: _____.

Plan Check Fee Information:

Person/Company Paying Fee: _____

Address: _____

Phone: _____ Fax: _____

APPENDIX VIII

LA COUNTY FIRE DEPARTMENT CONTACTS

Forestry Division

Fuel Modification Unit

605 North Angeleno Avenue
Azusa, California 91702
(626) 969-5205

Fuel Modification Unit – Calabasas Field Office

26600 Agoura Road
Calabasas, CA 91302

Fuel Modification Unit – Lancaster Field Office

335-A East Avenue K-6
Lancaster, CA 93535
(661) 729-6386

Brush Clearance Unit

605 North Angeleno Avenue
Azusa, California 91702
(626) 969-2375

Fire Prevention Division

Building Plan Check Unit

Calabasas Office

26600 Agoura Road
Calabasas, CA 91302
(818) 880-0341

Commerce Office

5823 Rickenbacker Road
Commerce, CA 90040
(323) 890-4125

Glendora Office

231 W. Mountain View Avenue
Glendora, Ca 91741
(626) 963-0067

Hawthorne Office

4475 W. El Segundo Boulevard
Hawthorne, CA 90250
(310) 263-2732

Building Plan Check Unit (continued)

Lancaster Office

335-A East Avenue K-6
Lancaster, CA 93535
(661) 949-6319

Pomona Office

590 S. Park Avenue
Pomona, CA 91766
(909) 620-2216

Santa Clarita Office

23757 Valencia Boulevard
Valencia, CA 91355
(661) 286-8821

Land Development Unit

5823 Rickenbacker Road
Commerce, CA 90040
(323) 890-4243

FIRE CODE REQUIREMENT FOR FUEL MODIFICATION PLANS

4908.1 Fuel Modification Plan in fire hazard severity zones. *A fuel modification plan, shall be submitted and have preliminary approval prior to any subdivision of land and have final approval prior to the issuance of a permit for; any permanent tent, yurt, trailer, or other structure used for habitation, to the issuance of a permit for any structure that changes occupancy classification from a non R to R type occupancy, and new construction, remodeling, modification, or reconstruction of: (1) any enclosed structure over 120 square feet, (2) any structure enclosed on three sides or more and greater than or equal to 200 square feet, (3) any structure greater than or equal to 400 square feet, where such remodeling, modification, or reconstruction increases the square footage of the existing structure or footprint by 50 percent or more within any 12-month period, and where the tent, yurt, trailer, structure or subdivision is located within areas designated as a Fire Hazard Severity Zone in Title 24 within the State Responsibility Areas or Very High Hazard Severity Zone within the Local Responsibility areas in Chapter 7A of the Los Angeles County Building Code, applicable Hazard Zone maps, and Appendix M of this code at the time of application. Every Fuel Modification Plan, shall be reviewed by the Forestry Division of the Fire Department for defensible space, reasonable fire safety, and compliance with Sections 325.2.1, 325.2.2, 325.10, and 503.2.1 of this code, the Fire Departments Fuel Modification Guidelines, and California Code of Regulations Title 14, Division 1.5, Chapter 7, subchapter 2.*

After such final plan has been approved by the Forestry Division of the Fire Department, a signed and notarized copy of the provided Covenant and Agreement and or previously reviewed and approved association CC&Rs that include the necessary fuel modification information, shall be recorded at the registrar-recorder/county clerk's office and a copy given to the Fuel Modification Unit prior to site inspection and release. The Fuel Modification Inspection ensures compliance with applicable requirements of this code and Building Code Chapter 7A, section 701A5 (Vegetation management compliance), and must be conducted and inspection release achieved prior to occupancy being granted.

Any modification to the approved landscape plan or addition to the structure that affects the approved zones must be reviewed and approved by the Fuel Modification Unit prior to installation of landscaping or issuance of permit for such an addition.